amateur radio

APRIL, 1974

- IS AMATEUR RADIO NECESSARY?
- BRISBANE VALLEY FLOOD DISASTER
- ADDITIONAL BAND COVERAGE FOR THE HEATHKIT HW32A
- BROAD BAND TRAVELLING WAVE DIPOLE
- SOME THOUGHTS ON THE G5RV
- ROSS HULL CONTEST 1974 RESULTS

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

GRID DIP METER
SPECIFICATION **Model TE-15**

Freq. Range: 440kHz-280MHz in 6 Coils
A Coil 0.44—1.3MHz
B Coil 1.3—4.3MHz
C Coil 4.14MHz
D Coil 14.40MHz
F Coil 120-280MHz
Transistor: 3 TR's & 1 Diode
Meter: 500uA Fs.
Battery: 9V (BL-006P)
Dimensions: 180x80x40mm
Weight: 730g

Price $36.50
P & P $1.00

DELUXE AUDIO GENERATOR
SPECIFICATION **Model HE-22D**
Model TE-22D

Freq. Range: Sin: 20Hz-200kHz
Square: 20Hz-25kHz
Output Voltage: Sine: 7 volt.
Square 7 volt
Output Impedance: 1000 ohm
Freq. Accuracy +3% + 2Hz
Distortion: Les than 2%
Tube Complement: 6BM8
12 AT7, 6Z4
Power Source: 105-125, 220-240V AC, 50/60 cps. 19W
With Attenuation Range
4 Ranges—1/1, 1/10, 1/100, 1/1K

Compact-Space Saving.
Printed Circuit for uniform Characteristics.
Low Distortion
Dimensions: 140 x 215 x 170mm
Weight: 2.8kg.

Price $49.50
P & P $2.00

DX150B REALISTIC with SEPARATE SPEAKER

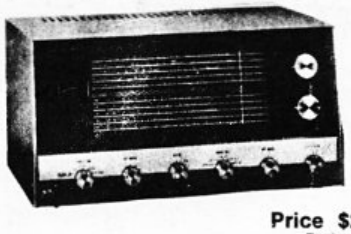
The popular REALISTIC DX150B which has gone from strength to strength with amateurs, short-wave and broadcast listeners alike, now has a further improvement, A SEPARATE MATCHING SPEAKER included.
The DX150B gives long-range, world-wide realistic reception on 4 bands, including Broadcast Fully transistorised-all solid state-no warm-up delays, the DX150B will run on dry cells if current fails or is not available, will operate from a car's cigarette lighter or any 12V DC service. A 240V AC power supply is also built in. Over 30 semi-conductors-product detector for SSB/CW, plus fast and slow AVC-variable pitch BFO-illuminated electrical band-spread, fully calibrated for amateur bands-cascade RF stage-ANL for RF and AF-zener stabilised-OTL audio-illuminated "S" meter.

Price ~~$229.00~~
now price — **$189.00** P & P $2.00

LAFAYETTE HA-600A SOLID STATE
GENERAL COVERAGE

5 BANDS 150-400 kHz, 550-1600 kHz (Broadcast band), 1.6-4.8 MHz, 4.8-14.6 MHz, 10.5-30 MHz.
Operates from 12 Volts DC (negative ground) or 220-240 Volts 50 Hz.

- Field Effect Transistors in RF Mixer and Oscillator Stages.
- Two Mechanical Filters for exceptional selectivity.
- Voltage Regulated with Zener Diodes.
- Product Detector for SSB/CW.
- Edge illuminated Slide Rule Dial with "S" Meter.
- Continuous Electrical Bandspread Calibrated 80-100M Amateur Bands.
- Variable BFO, Automatic Noise Limiter.
- Speaker Impedance: 4 to 16 ohms.



Price $215.00
P & P $2.00

Also available — HA800B Amateur Band. 6 Bands 3.5MHz to 29.7MHz and 50-54MHz as above features with 100kHz calibration **facility: $210.00. 100kHz** Xtal Extra **$10.75.** P & P $2.00

SOLID STATE WIDEBAND RF SIGNAL GENERATOR
MODEL SG-402

This is an all solid state, wide-band RF Signal Generator which produces low impedance low distortion RF signals. It is highly dependable and easy to operate, and is a handy working instrument for service benches and electronic equipment production centres.

SPECIAL FEATURES
1. Generates wide range signals from 100kHz to 30MHz in six frequency ranges.
2. All solid state construction for instant waveforms, compact and lightweight portability.
3. Includes 400Hz signal source for modulation of output signal, which can be modulated by external sources.

Price $99.50. p & p $2.00

P.M.G. TYPE TELEPHONES—DIAL TYPE EXTENSION

Ericaion Type manufactured by L. M. Ericson. As used by PMG Dept. As new condition. Dial in base. **$19.50** Tested. p&p 75c
Black Phone. Chrome Dial Standard type. Robust construction. **$7.95.** Few only p&p 75c
Plastic Type. Standard PMK type. Manufactured by L. M. Ericson. As new tested. All phones fitted with standard phone plug and socket. **$17.50.** p & p 75c
Double Phone Plug, 6.5mm **75c**
Standard 2 Circuit Phone Plug PMG Type **30c**
PMG Type Counters, 4 digit, 48 Volt operation **50c**
PMG Type Telephone Plug & Socket, round type.
PMG Type Phone Plug & Socket, standard Ericson Type White Plastic **95c per pair**
PMG Type Telephone Extension Bells, 48V **$2.00**
230 Volt RVB Horn Tested **$7.50**

TRIO 3" OSCILLISCOPE DC — 1.5 MHz MODEL CO-1303A
SPECIAL FEATURES

1. Vertical sensitivity of 20 mV/cm, three step attenuation, AC DC operation & wideband frequency response from DC to 1.5MHz.
2. DC vertical and horizontal amplifiers for wide versatility make possible external sweep speeds of less than 1Hz.
3. All solid state construction for compact, lightweight portability.
4. Smoked filter glass CRT face and exclusive designed graticule, graduated in dB for clear waveform comparisons.
5. Direct input to 150MHz for SSB and AM transmission monitoring.

Price $150. p & p $2.00

Plessey C42 Transceivers
Frequency coverage 36-60MHz
FM complete with power supply, handsets, cables, in-built calibrator
from **$40.00**

BC221 Frequency Meters cover 125kHz to 20MHz
from **$35.00**

Large range of hard-to-get Rola output Transformers
from **$2.00**

Several types of ex-Army transceivers
from **$15.00** each

HAM RADIO
(Disposal Branch)
104 Highett Street, Richmond, Vic., 3121
Phone: 42-8136

HAM RADIO SUPPLIERS
323 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones: 67-7329, 67-4286 All Mail to be addressed to above address

Our Disposals Store at 104 HIGHETT ST., RICHMOND (Phone 42-8136) is open Mondays to Fridays, 10.30 a.m. to 5.0 p.m., and on Saturdays to midday.

NEW STATIONS, OCT., 1973 (continued)

N.S.W.

2ZJS—J. Drinkwater, 28 Busby Rd., Busby 2168.
2ZKW—G. C. Watson, 6 Porter Ave., E. Maitland 2323.
2ZNG—A. R. Marjoram, 53 Kentucky St., Armidale 2350.
2ZUE/T—B. P. K. Smart, 4 Byron Ave., St. Ives 2075.
2YBK—G. B. Cooke, 11 Joffre St., S. Hurstville 2221.
2YBL—T. Lightfoot, 13 Hunts Av., Eastwood 2122.
2YBP—D. B. Poulton, 114 Copeland Rd., Beecroft 2119.
2YBV—J. E. Vincent, L.2 Vincent Rd., Kurrajong 2758.
2YBX/T—G. A. Crapp, C/- 55 St. Johns Ave., Gordon 2072.

A.C.T.

VK1CA—Commonwealth Dept. of Education, Canberra Tech. College Constitution Ave. 2601.
1CB—J. W. Bisset, 40 Quiros St., Red Hill 2603.
1CO—A. Huisman, 46 Somerset St., Duffy 2611.
1ZAG—I. J. Dalwood, Gowrie Pvt. Hotel, Northbourne Ave., Braddon 2601.
1ZAH—J. F. Davis, 37 Ingamellis St., Garran 2605.
1ZAJ—I. W. Jones, 35 Hawker St., Torrens 2607.
1ZMV—M. R. Valevicius, 13 De Chair St., Deakin 2600.

VICTORIA

VK3DM—J. W. Golding, 15 Myamyn St., Malvern 3144.
3RJ—R. E. Jones, 23 Lundale St., Box Hill 3128.
3WU—A. C. Greening, 57 Glen St., Glenroy 3046.
3AMM—A. C. Edwards, 384 Glenferrie Rd., Malvern 3144.
3APP—R.A.A.F. Laverton Radio Club, R.A.A.F. Base, Laverton 3028.
3BHG—Van Galen G. W. (Nominee H. Reid), 13 Clivedon Crt., Leopold 3221.
3BPC—St. Paul College Radio Club, Grey St., Traralgon 3844.
3ZEV—I. C. Batty, 81 Liddiard St., Hawthorn 3122.
3ZQI—G. R. Wambach, 8 Hurra Crt., Oak Park 3046.

QUEENSLAND

VK4QQ—I. S. Graham. Station: Dakenba Rd., Mt. Murchison. Postal: P.O. Box 507, Biloela 4715.
4UE—C. V. Higgins, 26 Fulham Rd., Pimlico, Townsville 4810.
4VI—K. C. Parker, 27 Oxley St., Edge Hill, Cairns 4870.
4EN—R. J. Kerle, 32 Evan St., Mackay 4740.
4OQ—L. H. Ferris, 32 Arthur St., N. Cairns 4870.
4ZSA—A. M. Salmons, 84 Bellicent Rd., Bracken Ridge 4017.
4RA—R. J. Rush, 21 Angelina St., MacGregor 4109.
4VE—A. Christopher, 21 Keenan St., Margate 4019.

SOUTH AUSTRALIA

VK5GW—G. J. Whiteside, 12 Warwick St., Enfield 5085.
5PV—P. M. M. Van Der Velden, 5 James St., Reynella 5161.
5SL—P. Lawson, 1 Doreen St., Prospect 5082.
5VX—R. J. Dindscheid, 5 Wallace St., East Glenelg 5045.
5ZFR—N. F. Francis, 17 Mortimer Rd., Berri 5343.

WESTERN AUSTRALIA

VK6ZKV—D. R. Schofield, 8 Tyre Ave., Riverton 6155.
6SL—S. Magazinovic, 35/61 Wright St., Highgate 6000.

TASMANIA

VK7BE—E. J. Bartkus, 15 Olga St., Strathgordon 7458.
7ZBB—B. E. Baynes, 847 Huon Rd., Fern Tree 7101.
7ZBH—M. B. Hooper, 65 Riawena Rd., Montagu Bay 7018.
7ZDA—D. A. Apted, 65 Brougham St., Launceston 7250.
7ZDG—G. D. Noble, 32A King St., Bellerive 7018.
7ZJJ—J. Jongbloed, 5 Eden Pl., Howrah 7018.
7ZWW—M. R. Wilson, 11 George Town Rd., Newnham 7250.

NORTHERN TERRITORY

VK8BW—G. B. Widnall, 113 Smith St., Alyangula 5798.

CHANGE OF ADDRESS

VICTORIA

VK3EE—F. V. Hughes, 29 Avondale Rd., Morwell 3840.
3FJ—C. R. Nelson, 29 Grace St., Bendigo 3500.
3IM—T. J. Hunt, 20 Raven's Crt., Crescent, Mount Eliza 3930.
3LK—R. J. Elliott, Princes Hwy., Heathmere 3305.
3NZ—N. D. White, 59 Charles St., Ascot Vale 3032.
3PS—E. Salamy, 61 Verdon St., Warrnambool 3280.
3SS—K. V. Scott, Postal Address: 405 Princes Hwy., Noble Park 3174.
3AEA—E. C. Rowse, Unit 4, 24 Lemark St., Clayton 3124.
3AWN—W. N. Newham, 75 Cooloongatta Rd., Camberwell 3168.
3CIF—P. B. Dodd, 1306 Glenhuntly Rd., Glenhuntly 3163.
3YDD—W. Yunker, 757 Glenferrie Rd., Hawthorn 3122.
3ZHL—S. J. Heath, 15 Sandhurst Cres., Bundoora 3083.
3ZKA—K. J. Schache, 18 Rosella Ave., Boronia 3155.
3ZRK—R. Kreymborg, 6 Patyah St., Diamond Creek 3089.
3ZZV—G. Fells, 6 Leeds Pl., Campbellfield 3061.

QUEENSLAND

VK4HG—H. J. Hicks, Tate Rd., Tolga 4882.
4ID—J. M. Wright, "Red Marley", Central Ave., Eagle Heights 4271.
4KL—P. D. Cox, Kerrs Lne., Nambour 4560.
4KV—M J. Y. McCartney, 21 Fairweather St., Yorkeys Knob 4870.
4MA—A E. Morrison, Johnston St. M.S. 2116 Goodna 4300.
4OG—Gold Coast Radio Club, Station: Cnr. Hillcrest Pde. & Paradise Ave., Miami. Postal: P.O. Box 588, Southport.
4OP—R. K. Pietrala, 3 Brahms St., Strathpine 4500.
4HK/T—K. F. Hoffman, 10 Druce St., Toowoomba (TV experiments) 4350.
4ZK—R. M. Feenaghty. Postal: P.O. Box 63, St. Lucia 4067.
4ZCL—G. J. Castledine, 10 Park Rd., Ferny Hills 4055.
4ZWO—T. W. Mitchell, 18 Laurier St., Annerley 4103.

SOUTH AUSTRALIA

VK5BQ—B. C. Cleworth, 13 Coronation St., Campbelltown 5074.
5VP—E. J. V. Willis, 7 Garra Ave., Modbury 5092.
5ZFF—M. Hanna, 59 MacKinnon Pde., North Adelaide 5006.
5ZKJ—B. F. Brockhouse, 4 Maple Ave., Felixstow 5070.
5ZRT—R. Battilana, 4 Dee St., Windsor Gdns. 5082.

WESTERN AUSTRALIA

VK6PR/T—R. T. Fisher, 51 Milton St., Glendalough 6016.
6TW—T. S. Long, 24 Hynes Rd., Dalkeith 6009.
6MR—M. P. Ryan, 6/31 Market St., Guildford 6055.
6RX—A. W. Clowes, 39(A) North Beach Rd., Balcatta 6021.
6ED—E. F. Davies, 32 Dorset St., Busselton 6280.
6RY—R. H. Latham, 22 Drew Rd., Ardross 6153.
6ZKL—R. P. Lockley, 22 Pembroke St., Bicton 6157.

TASMANIA

VK7BC—C. F. Beech. Station: Nobelius Dr., Legana. Postal: P.O. Box 146, Legana 7251.
7OH—A. J. O'Halloran, 4 Kirkland Ave., Glenorchy 7010.
7ZPA—P. M. Cox, 82 Hill St., West Hobart 7000.

NORTHERN TERRITORY

VK8KS—K. C. Smith, 66 Esplanade, Darwin 5790. P.O. Box 2099, Darwin, N.T. 5794.
8MC—B. A. McRae Postal only: Box 433 P.O., Tennant Creek 5700.
8MD—B. A. McRae. Postal only: Box 433 P.O., Tennant Creek 5700.

CANCELLED STATIONS

VICTORIA

VK3AGB—J. W. Goding. Now VK3DM.
3ARC—R.A.A.F Laverton Radio Club. Now VK3APP.
3AQV—W. T. Moffat. Transferred to Tasmania.
3AWW—R. F. Lopez. Transferred to N.S.W.
3BBD—A. K. Bothe. Not renewed.
3BED—P. Bennett. Not renewed.
3CEC—C. A. Cantor. Not renewed.
3YFV—A. J. Crane. Transferred to N.S.W.
3ZFV—R. H. Baker. Not renewed.
3ZMD—J. F. Davis. Not renewed.
3ZSR—A. C. Greening. Now VK3WU.

QUEENSLAND

VK4ZCY—C. V. Higgins. See VK4UE.
4ZAT—R. J. Kerle. See VK4EN.
4ZIS—I. S. Graham. See VK4QQ.
4DD—J. Rooks. Moved to Sydney.
4RI—R. H. Gordon. Left address.
4SA—S. J. Armstrong. Deceased.
4ZBA—A. Christopher. Now Unrestricted (see above).
4ZRU—R. J. Rush. Now Unrestricted (see above).

SOUTH AUSTRALIA

VK5EV—J. J. Mount. See new station VK5EV.
5HY—A. F. Cotton. Deceased, previously incorrectly advised as VH5NY.
5UP—R. L. Parnell. Not renewed.
5ZJG—G. J. Whiteside. See new station VK5GW.
5ZOS—O. G. Schmidt. Transferred to Victoria.
5ZSL—P. Lawson. See new station VK5SL.
5ZWG—G. N. Philpott. Not renewed.

TASMANIA

VK7ZAJ—P J. Edwards, 28 Bain Rerr., Launceston 7250 (Non-payment of renewal fee).

NORTHERN TERRITORY

VK8PV—P. M. M. Van Der Velden. Transferred to South Australia.

PAPUA NEW GUINEA

VK9KA—O, S. Dahl. Station: Lot 6, Sect. 80 Gordon's Estate, Port Moresby. Postal: P.O. Box 5645, Boroko.

NEW CALL SIGNS

NOVEMBER, 1973

VICTORIA

VK3GJ—K. A. Pallister, 3/30 Cootamundra Crescent, Blackburn, 3130
VK3FH—D. D. Paine, 15 Thumes Street Frankston, 3199.
VK3NO—A. J. Oxnam, 7 Munro Street, Macleod, 3085.
VK3VO—R. C. Lile, 592 Parke Street, Carlton North, 3054.
VK3WC—C. R. Nelson, 29 Grace Street, Bendigo, 3550.
VK3WL—R. A. Jones, 9 Norge Street, Sunshine, 3020
VK3ANL—Altona North Technical School, (nominee: R. T. Ayton), Millers Road, Altona, 3025.
VK3AQW—L. Woolf, 388 Alma Road, Caulfield, 3161.
VK3BHB—J. C. Buckley, 1/6 Carmichael Street, West Footscray, 3012.
VK3CCD—L. A. Davies, 39 Delbridge Street, North Fitzroy, 3068.
VK3YHH—T. D. Dowie, Sundowner's Caravan Park, 870 Princes Highway, Springvale, 3171.
VK3YSK—D. E. Ditchfield, 89 Welington Street, Windsor, 3181.
VK3ZBT—B. D. Hackett, 20 Templewood Avenue, Noble Park, 3174.
VK3ZFS—J. Somerville, 24 Peachey Street Casterton, 3311.
VK3ZGB—C. E. Benson, 1/95 Aitken Street, Williamstown, 3016.
VK3ZNO—A. N. Chantler, 9 York Street, Sale, 3850.
VK3ZOM—D. G. Marshall, 18 Ronley Street, Blackburn, 3130.
VK3ZRJ—R. J. McCauley, 28 Black Street, Watsonia, 3087.
VK3ZRR—R. A. J. Reynolds, 38 Bellett Street, Camberwell, 3124.
VK3ZVH—J. B. Ellis, 28 Maclise Street, Castlemaine, 3450.

QUEENSLAND

VK4EN—R. L. Reseck, 119 Kate Street, Indooroopilly, 4068.
VK4UI—R. J. Williams, 20 Nerang Coast Road, Miami Keys, Broadbeach, 4217.
VK4VT—O. S. Dahl, Station: Palmvilla, Coquetta Road, Innisfail, 4860.
Postal: P.O. Box 103, Innisfail. 4860.
VK4XE—P. T. Ament, 36 Range Street, Toowoomba, 4350.
VK4XU—A. R. Kruger, 14 Crown Stret, Wynnum, 4178.
VK4YE—R. H. Kyle, Station: Permanent Mobile, Postal: P.O. Box 20, Leyburn, 4361.
VK4WIG—Gold Coast Radio Club, Station: Cnr. Hilcrest Parade & Paradise Avenue, Miami, 4220.
Postal: P.O. Box 588, Southport, 4215.
VK4ZPW—W. Spring, Station: 25 Alma Stret, Paddington, 4064.
Postal: P.O. Box 127, North Quay, 4000
VK4ZTC—A. J. Crane, 50 Park Terrace, Sherwood, 4075.

SOUTH AUSTRALIA

VK5DL—A. R. Dexter, Unit 1/58 Princes Road, Torrens Park, 5062.
VK5GO—G. P. Summers, 27 Barbara Road, Salisbury East, 5109.
VK5VK—W. R. Franzi, 195 Riversdale Road, American Beach, K.I. (Postal: 7 Short Avenue, Glenelg East), 5045.
VK5ZBP—B. G. Pierce, 17 Littler Drive, Fairview Park, 5126.
VK5ZMH—M. J. Harat, 5 Mira Street, Gepps Cross, 5094.

WESTERN AUSTRALIA

VK6PF—F. A. Parsonage, Lot 99 Abbott Way, Swan View, 6056.
VK6QR—D. M. Maley, 12 Venn Street, Peppermint Grove, 6011.
VK6GS—G. W. Smith, 2 Urban Street, Wagin, 6315.
VK5ZHS—H. F. Skipworth, Station: 21 Dorothea Street, Kalgoorlie, 6430.
Postal: P.O. Box 111, Kalgoorlie, 6430.
VK6ZKT—K. T. Kenny, 134 Petra Street, Bicton, 6157.
VK6ZEQ—A. W. Pike, 6 Latham Street, Alfred Cove, 6154.

TASMANIA

VK7TM—W. T. Moffat, 7 Shannuk Drive, West Hobart.

NORTHERN TERRITORY

VK8JT—T. S. H. Jones, 4947 Radford Court, Nightcliff, 5792.

T.P.N.G.

VK9BG—Lt. B. M. Gabb, Station: EMQ 16, Murray Barracks.
Postal: P.O. Box 696, Boroko.
VK9GB—G. L. Bell, Station: D.C.A. Single Mens' Quarters, Kone.
Postal: P.O. Box 3623, Port Moresby.
VK9ZBF—H. D. Francis, Station: Morehead W.D. PNG.
Postal: C/- Digicon (Aust.) Ltd., P.O. Box 3279, Port Moresby.

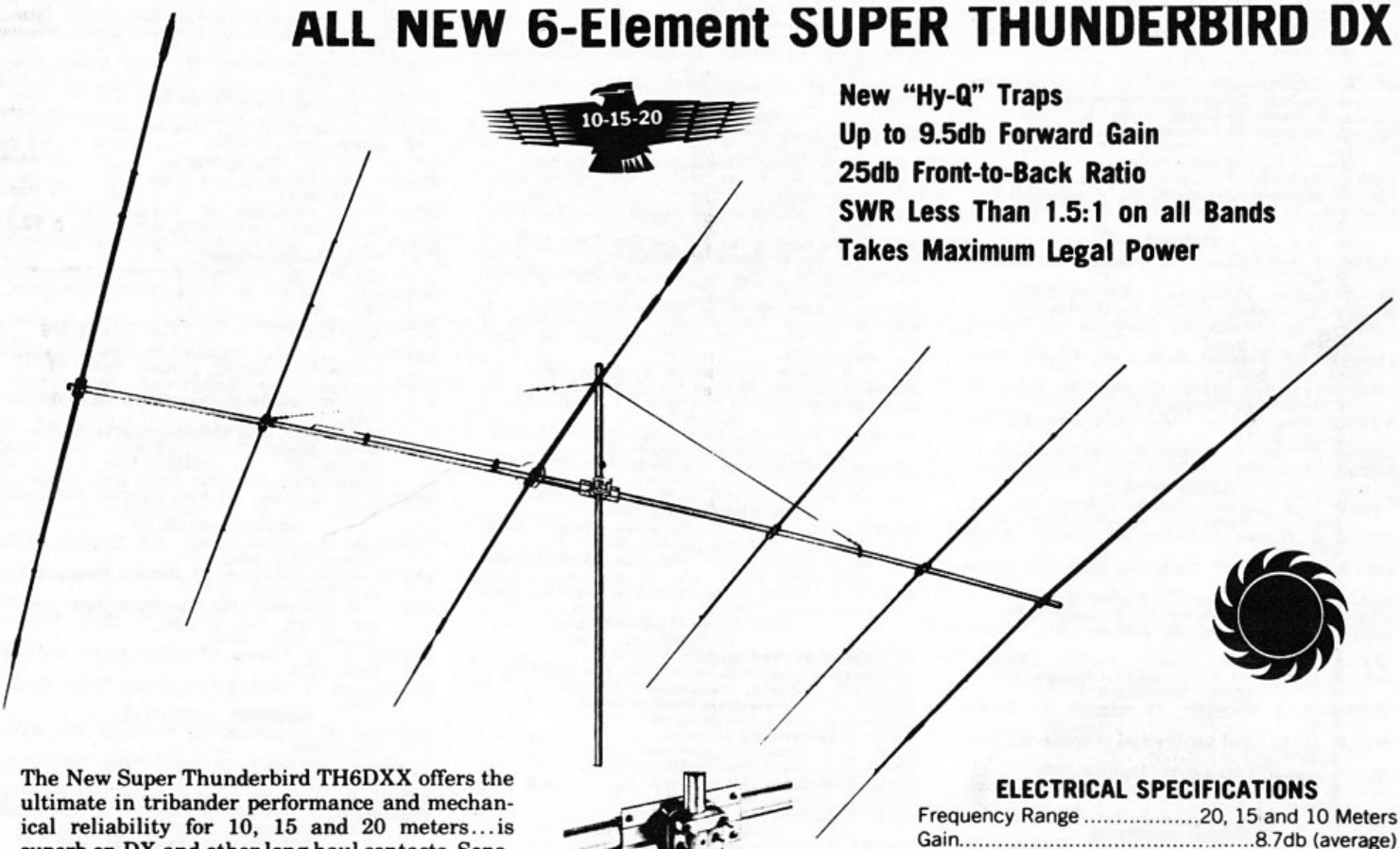
CHANGE OF ADDRESS

VICTORIA

VK3UW—Captain R. B. Wallace, 1 Strathmerton Street, Reservoir, 3073.
VK3VE—L. D. Hayward, 64 Hansworth Street, Mulgrave, 3170.
VK3YZ—A. McKeown, 3 The Esplanade, Ocean Grove, 3226.
VK3ADV—B. D. Alexander, Alexander Road, Skipton, 3361.
VK3AHJ—R. J. Harrison, 7 Kathleen Street, Pascoe Vale South, 3044.
VK3ANE—Youth Radio Club Scheme of Victoria, 204 Churchill Avenue, Braybrook, 3019.
VK3BBN—J. Rotenberg, 11/495 Royal Parade, Parkville, 3052.
VK3BFL/T—H. H. Chittock, 11 Little Myers Street, Geiong, 3220.
VK3YBQ—W. A. Wright, 10/103 York Street, Sale, 3850.
VK3YCW—A. White, 6/574 Glenferie Road, Hawthorn,, 3122.

hy-gain NEW SUPER THUNDERBIRD TRIBANDER BEAMS from BAIL ELECTRONICS

ALL NEW 6-Element SUPER THUNDERBIRD DX



New "Hy-Q" Traps
Up to 9.5db Forward Gain
25db Front-to-Back Ratio
SWR Less Than 1.5:1 on all Bands
Takes Maximum Legal Power

The New Super Thunderbird TH6DXX offers the ultimate in tribander performance and mechanical reliability for 10, 15 and 20 meters...is superb on DX and other long haul contacts. Separate Hy-Q traps, featuring large diameter coils that develop an exceptionally favorable L/C ratio and very high Q, provide peak performance on each band whether working phone or CW. Exclusive Hy-Gain Beta Match, factory pre-tuned, insures maximum gain and F/B ratio without compromise. Feeds with 52 ohm coaxial cable...SWR less than 1.5:1 on all bands. Mechanically superior construction features taper swaged, slotted tubing—allows easy adjustment and readjustment. Taper swaged tubing permits larger diameter where it counts! And, less wind loading. Full circumference compression clamps are mechanically and electrically superior to self-tapping sheet metal screws. Large diameter, heavy gauge aluminum boom...heavy cast aluminum boom to mast clamp and heavy gauge machine formed element to boom brackets. A totally new dimension in Tri-Bander performance.

Tilt-head, universal boom-to-mast bracket —all new, cast aluminum bracket accommodates masts from 1¼" x 2½". Allows easy tilting for installation, maintenance and tuning, provides mast feed-thru for beam stacking.

Taper swaged, slotted tubing — new tubing on all elements allows easy adjustment and re-adjustment. Taper swaged to permit larger diameter tubing where it counts! And, less wind loading. Full circumference compression clamps are mech. and elec. superior to self-tapping sheet metal screws.

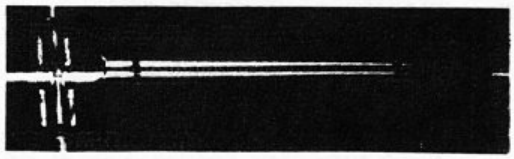
Extra heavy gauge, machine formed element-to-boom brackets, with plastic sleeves used only for insulation. Bracket design allows full mechanical support.

ELECTRICAL SPECIFICATIONS

Frequency Range	20, 15 and 10 Meters
Gain	8.7db (average)
Front-to-Back Ratio	25db
Maximum Power Input	1 kw AM; 2 kw P.E.P.
VSWR (at resonance)	1.5:1
Impedance	50 ohms

MECHANICAL SPECIFICATIONS

Longest Element	31.1 ft.
Boom Length	24 ft.
Turning Radius	20 ft.
Wind Load at 80 MPH	156 lbs.
Maximum Wind Survival	100 MPH
Net Weight	61.5 lbs.
Mast Diameter	1¼" to 2½"
Boom Diameter	2"
Surface Area	6.1 sq. ft.



Hy-Gain Beta Match — Advanced design from company that invented the Beta Match. Tapered impedance provides most efficient 3 band matching. Provides DC ground to eliminate precipitation static.

AVAILABLE NOW EX STOCK

BAIL ELECTRONIC SERVICES

60 Shannon St., Box Hill North, Vic., 3129.

Ph. 89-2213

Qld. Rep.: MITCHELL RADIO CO., 59 Albion Road, Albion, 4010, Telephone 57-6830

N.S.W. Rep.: **STEPHEN KUHL, P.O. Box 56, Mascot, N.S.W., 2020.** Telephone: Day 667-1650 (AH 371-5445)
South Aust. Rep.: **FARMERS RADIO PTY. LTD., 257 Angas St., Adelaide, S.A., 5000.** Telephone 23-1268
Western Aust. Rep.: **H. R. PRIDE, 26 Lockhart Street, Como, W.A.. 6152.** Telephone 60-4379

amateur radio

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CONTENTS

TECHNICAL —

A Broad Band Travelling Wave Dipole 18
A Review of the Belcom Liner 2 SSB Transceiver 16
Additional Band Coverage for the Heathkit HW32A 13
Commercial Kinks—Geloso G222 21
Experiments In Modulation and Audio (part two) 8
Newcomers Notebook—Equipment, Layout and Design 20
Some Thoughts on the G5RV 14
Try This 21
UHF Dipper 19

DEPARTMENTS —

Awards Column 22
Contests 23
Hamads 30
Letters to the Editor 22
Magazine Index 22
QSP—World Administrative Conference 7
Ross Hull Contest 1973-74 Results 23
Silent Keys 30
The 40 and Overs 30
VHF-UHF An Expanding World 24
YRS 30
20 Years Ago 30

GENERAL —

A Success Story—Japanese Amateur Radio 15
Brisbane Valley Flood Disaster 10
Is Amateur Radio Necessary 19

FRONT COVER

ROY, VK4ZQ and his well equipped station played an important part in the recent Brisbane Flood Disaster.
Full story on page 10

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	*5.0-5.5,	*6.0-7.0,	7.0-7.5,	*9.5-10.0	
	*11.5-12.0,	14.0-14.5,	*15.0-15.5,	*17.5-18.0	
	21.0-21.5,	*21.5-22.0,	*25.5-26.0,	*26.0-27.0	
	*27.0-27.5.	28.0-28.5,	28.5-30.0		
	VHF	50-52 or52-54			
		144-146 or 146-148			
Sensitivity	SSW/CW	-6db at S/N 10db			
	AM	0db at S/N 10db			
	FM	0db at 12db SINAND			

Selectivity	CW	0.6kHz/6db	1.5kHz/60db
	SSB,RTTY	2.4kHz/6db	4kHz/50db
	AM	6kHz/6db	12kHz/50db
	FM	20kHz/6db	45kHz/50db
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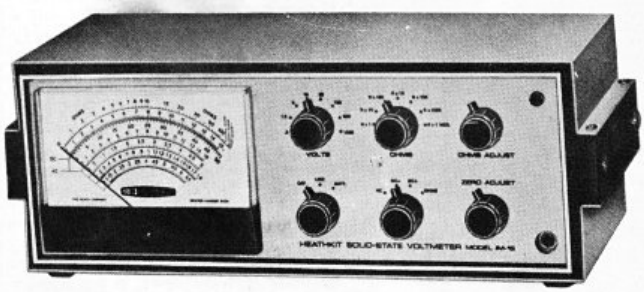

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QSP

In 1979 there is to be a World Administrative Conference of the ITU which will consider the whole radio frequency spectrum. At this conference Australia will only have one voice and one vote.

As you will no doubt have noticed there are many new independent countries who have gained membership of the ITU since the last conference which considered the whole frequency spectrum.

That conference was held in Geneva in 1959.

Those of you who have read Tom Clarkson's ZL2AZ's reports and articles on his experiences at the 1971 Space Conference will realise that there are many delegates who are unsympathetic to Amateur Radio.

In many cases this is due to a lack of knowledge as to what Amateur Radio is.

The question, **Can the WIA do anything?** has its answer in the Region III Association.

Members will remember that the World is divided into 3 regions for IARU purposes. Region 1 covers Europe and Africa, Region 2 the Americas and Region 3—our Region—most of Asia and all of Australasia.

Members will also remember the vital part played by the WIA in 1968 towards establishing the IARU Region 3 Association. The secretariat of the region is located in Australia and the present Secretary is Mr. David Rankin, VK3QV/9V1RH. Some of the countries apparently inimical towards amateur radio —as evidenced by the voting of their delegates— are, unfortunately, to be found in this region.

At the forthcoming Federal Convention the Federal Council will be asked to consider what it thinks the appropriate action the WIA can take, and to give careful consideration as to which proposals it will put forward at the plenary meeting of the Association proposed by the directors to be held in Hong Kong late this year or early next year.

DAVID WARDLAW, VK3ADW
Federal President

technical articles for ar

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AR AWARDS

The Publications Committee announce the awards for the year 1973 as follows—

Higginbotham Award (worth $50) awarded to the South Australian Division for preparing the material for an issue of AR— Sept. '73.

Technical Award (worth $25) awarded to Tom Moffat, VK7TM, for his Discone contribution.

A.S.J.A. (Plaque and $10 cash) awarded to Syd Molen, VK2SG for his Las Balsas article in Dec., AR.

WIA—A.A.R.T.G.

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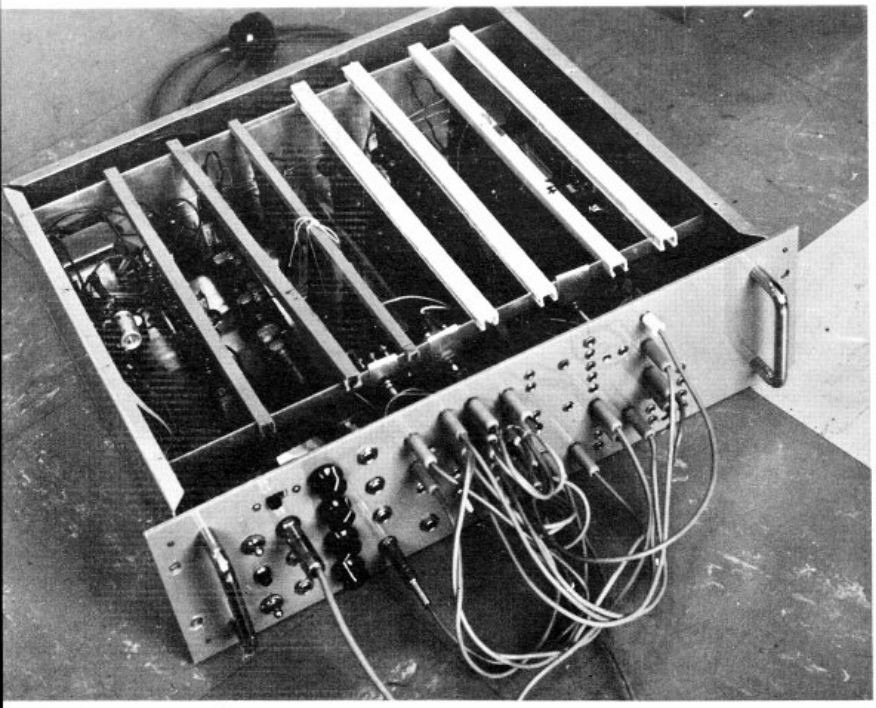


The complete equipment described in part two with the cover removed. Extreme left is the power supply; front left is a volume compressor: the rest of the units are described in the text.

Experiments in Modulation and Audio

part two

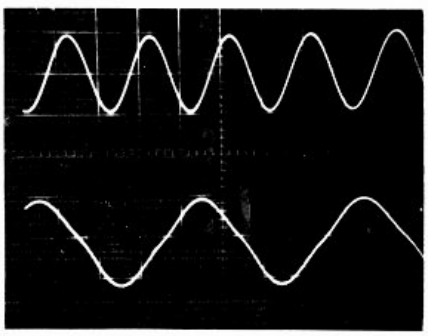
J. A. ADCOCK, VK3ACA
P.O. Box 106,
Preston, 3072

Based on the experiments with DSB discussed last month the author develops his ideas further to produce 1.5kHz bandwidth AM. Interested! Well read on and don't let the maths scare you too much.

For stage 2 of the experiments, it was necessary to construct an analogue computer. The computer contained:—

1. A 90 degree phasing unit of the type used for SSB generation.
2. Two IC multipliers capable of being programmed as multipliers, squarers, square rooters or dividers.
3. Two units to perform the function $x^2 + y^2$.
4. Two inverting adders with adjustable constants.
5. Two differentiating circuits with a time constant of 50 micro-seconds.
6. One pulse generating circuit which produces negative pulses on each negative or positive going (but not both) zero crossings of the wave form.

The multipliers used were uA795, and the operational amplifiers uA741. You can build any of the systems shown here by referring to the maker's application notes. There are also a number of other analogue units on the market at the present time which should perform just as well.



PHOTOGRAPH 1.—OPERATION OF FREQUENCY HALVER
Horizontal scale. 1 Division 1ms
The black diagram is shown in fig 7. Input signal is a 500Hz sinusoidal signal and is shown on the upper trace . Output is the lower trace. The 1500Hz filter is also in circuit.

NARROW BAND MODULATION, System 3

The system to follow is a method of halving the frequency of an audio wave form, transmitting it in the halved frequency form, and restoring it to it's original form after the receiver detector. The method described effectively halves the number of zero crossings of the audio wave form. This does not necessarily mean that the spectrum of the audio wave form is actually halved, since higher order transients are still present. The purpose of the experiment is to see how much can be "shaved off" the original for the audio to remain intelligible. There is also the possibility of the signal actually being pushed through a filter with a maximum band pass of half the maximum frequency in the original audio.

The bandwidth of any phone signal can thus be reduced by half, and area band occupancy doubled. The cost is increased distortion due to the loss of transients and other components that do not cause zero crossings. This distortion need not sound worse than say, that produced by 15db of clipping.

As the operation is achieved by means of an analogue computer, it is necessary to resort to mathematics to describe its operation.

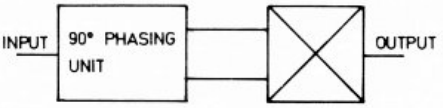


FIG 6 FREQUENCY DOUBLER

Let the audio being fed into the doubler be A sin O where A is the amplitude and O $= 2\pi ft$. Both A and f are variables and it represents elapsed time. The block diagram is shown in Fig 6.

The equation for the operation is

A sin O x A cos O = ½ A2 sin 2 O - (

A sin O and A cos O are taken as the outputs from the phasing unit.

Note that the amplitude of the output frequency is squared but the wave-form of the output is still sinusoidal for a sinusoidal input. This system has no practical use by itself unless it is used to restore a wave-form that has first been halved.

It should be pointed out, that in the trigonometric identities, it does not matter whether the answer is sine or cos, + or —, or whether the constant is ½ or 2. The wave form of the result is the only concern. These variations in amplitude can be restored by audio gain adjustments if necessary.

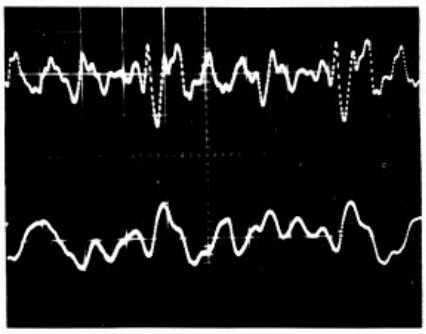
The process of frequency halving will now be described starting from the generally well-known identity

$2 \sin^2 O = 1 - \cos 2O$ (2)

This function is reversed calling the input signal A cos O. Thus

$\pm\sqrt{(A - A \cos O)} = 2A \sin \frac{1}{2} O$ (3)

Note ½ O represents half the frequency The A sin ½ O is what we want to finish up with. Despite the simplicity of this function, it is not possible to perform this operation mathematically without fur-



PHOTOGRAPH 2.—OPERATION OF FREQUENCY HALVER
Horizontal scale. 1 Division 2ms
Upper trace. Typical audio input. Lower trace, Half frequency audio output.

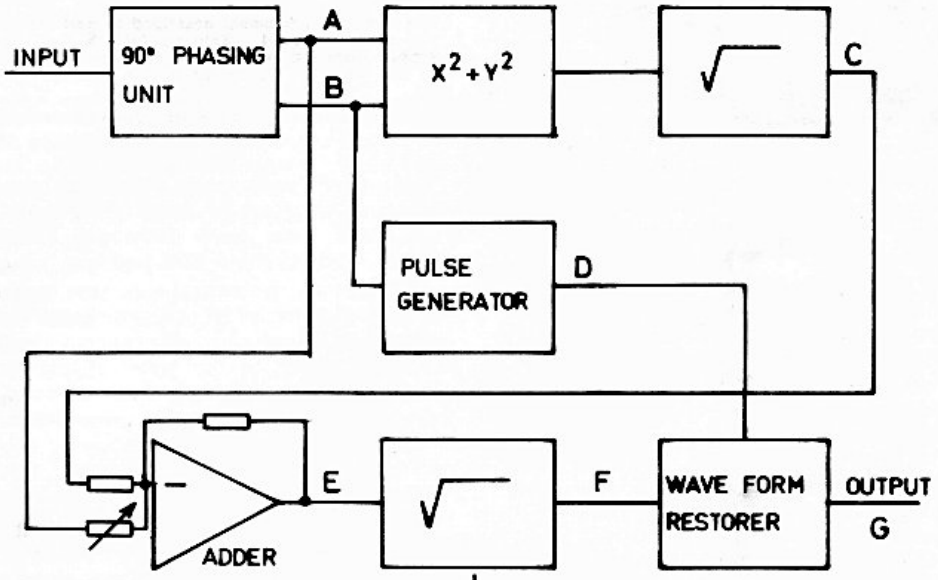


FIG 7 FREQUENCY HALVER

ther information, since the square root of a number has a positive or negative answer. To provide the positive or negative answer it is necessary to use the "wave form restorer" Figs 4 and 5. Also it is necessary to generate A, a voltage proportional to the amplitude of the wave form at the input.

$$A = \sqrt{[(A \sin O)^2 + (A \cos O)^2]} \quad (4)$$

This will be explained in more detail under systems 4 and 5. The block diagram of the whole system is shown in Fig 7.

Fig 8 shows the wave forms at each stage of the system. Figs 8A and 8B show the outputs from the phasing unit. Fig 8C is the output voltage proportional to the amplitude of the input signal from the function.

$$\sqrt{(A^2 \sin^2 O + A^2 \cos^2 O.)}$$

This is a DC voltage and in the case of a sine wave, is a constant value. On speech it will be the same as the output from an envelope detector tuned to an SSB signal, that is, DC but varying in amplitude at an audio rate. Fig 8E is the wave form of 8B added to 8C. Fig 8D shows the negative pulses required to trigger the flip-flop, derived in this case from the negative going zero crossings of the wave form 8A. Fig 8F shows the wave form of 8E after taking the square root in one sign only, namely

$$+\sqrt{(A + A \cos O.)}$$

Fig 8G shows the result after putting the signal through the wave form restorer of Fig 4 producing A sin ½ O. At the receiver end, by substituting A sin ½ O into equation—(1), the result is A sin O — the original expression! Thus we can theoritically divide or double the frequency of an audio signal.

That concludes the theoretical and idealistic description of the system. Now let us look at some hard cold facts.

The results so far have been interesting and even encouraging but far from perfect. The halved frequency audio has actually been transmitted by AM and received on AM using an SSB IF filter in the receiver with the signal tuned to the centre of the band pass. The system has also been tested both on and off the air using a 1.5kHz filter after the halver. It was found that some syllables came out clearly where as others suffer some kind of distortion.

It is the hope of the author that something worthwhile can be developed out of this system. The foregoing description of the system may encourage others to try methods along the same lines. For this reason, a brief description of the cause of the defects is given.

In the description, the speech wave form was considered to be a sine wave of continually varying frequency and amplitude. If it is considered to be a series of harmonics, one finds that, after processing, many components in the low frequency end of the spectrum, some zero frequency or DC components may be produced.

The phasing unit at the receiver in its present form cannot handle frequencies between 0 and 150Hz. Further, although the 90 degree phasing unit produces an accurate phase shift between the two outputs, there is an excessively large phase shift between the input and the output, due to other parts of the circuit. This varies with frequency. Thirdly, a large amount of distortion is produced at the zero crossings of the wave form. So far, methods of overcoming these defects directly have not been tried.

Surprisingly enough, if the signal at the receiver end is just squared instead of processed by the unit in Fig 6, most of the above problems are overcome. This will return the wave form to the form of Fig 8E — i.e. A + A sin O. The presence of + A does not add distortion. It is a DC signal and will not find its way through the audio sections of the receiver.

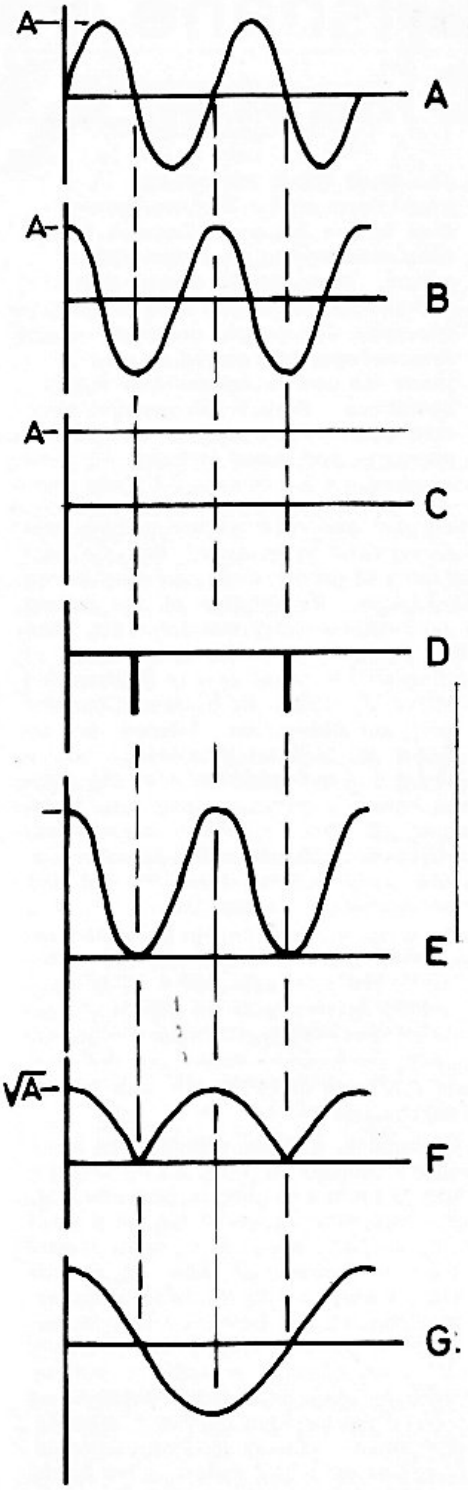


FIG 8 FREQUENCY HALVER WAVE FORMS

The main difficulty with the above method is that the signal would have to be transmitted by AM, with all stages DC coupled including modulator final. Unfortunately, so far, results of transmitting the system by SSB have been very poor. At the present time the author believes that many of the defects can be overcome.

(to be continued)

Brisbane Valley Flood Disaster

D. I. MARSHALL, VK4ZAF
23 Karowara Street,
The Gap, Brisbane, 4061.

The worst floods this century swept down on the Brisbane-Ipswich area in late January. Damage has been estimated at more than $200 million. Some 13 750 homes and perhaps 30 000 people were directly affected. Ten people drowned. Amateur operators played an important part in rescue and relief operations. Here is an account of their effort pieced together from the memories and notes of those involved.

Heavy rain and cyclones are nothing new in Queensland in summer. But the past summer was exceptionally wet even before mid-January. By January 24, the ground in the Brisbane Valley was saturated. Then along came cyclone Wanda. Instead of passing off the coast east of Brisbane as expected, it crossed the coast and became a vast rain depression. Intense rain up to 50mm (or 2in.) an hour lashed South-East Queensland generally and the Brisbane Valley in particular on Friday night, January 25. This resulted in record flooding in some Brisbane creeks. Many houses in low lying suburbs were flooded and some dashed to pieces.

But worse was to come in the main Brisbane River Valley and rain was continuing to fall. The first waves of a huge flood struck the Ipswich area on Saturday, January 26, and floodwaters rose so quickly downstream between there and the Brisbane City area many people were caught in their homes.

By Sunday, a major disaster was imminent in Brisbane. In 1973, a Civil Defence officer had told a meeting of Brisbane amateurs their services would not be needed in future. So it was with surprise I heard a plea on commercial radio on Sunday afternoon around 2.30 for two-way operators to contact Civil Defence headquarters.

I contacted Roy VK4ZQ and Malcolm VK4ZEL on Channel B 146MHz and we decided to offer an amateur network we felt could be arranged quickly if required.

CD's three telephone lines were jammed. So I put an extra 12V battery, a few leads, a portable ground plane and a pullover into the car fitted with VK3 Carphone and a curly whip on the roof. I managed to dodge flooded areas to drive to CD HQ in the Valley.

In short, CD Signals welcomed our offer and gave me priority to park at their front door (getting bogged in grass churned to a quagmire by four and six wheel drive vehicles previously!) By 4 p.m. I had confirmed the need for a network with Roy. It is a tribute to all involved that so many other stations had realised the disaster situation and had been listening to the deliberations on Channel B. At first call then, some 14 stations offered their services immediately or on standby and others kept calling in to add to the net. Most were capable of going mobile.

It was decided I stay at CD HQ to relay to Roy VK4ZQ who would be the base from his location high at the southern suburb of Moorooka with line of sight to most flood areas. He used his modified MR20B with a PA for 80 watts to a two element vertical collinear some 30 ft. up. (This had been erected only two days. Roy's antennas and towers had been smashed in Brisbane's freak tornado in November!).

Malcolm VK4ZEL at Holland Park West re-erected a beam quickly and was the back-up for Roy. (They found later their 240v supply came from different sub-stations and telephones from different exchanges).

The first CD task was to set up relief centres at chosen schools in anticipation of evacuations.

This was no mean task since messages to open the schools had gone to caretakers only by commercial radio. Our operators found themselves advised to break in with as little damage as possible and to turn on power. It was hoped some CD people or volunteers would arrive.

George VK4GV went to the Brisbane State High School, South Brisbane, followed by Henry VK4ZHK and John VK4ZJM Ross VK4ZFD to Taringa police station and then the school, Stephen VK4ZSH and Graham VK2ZZV to Rosalie Convent, Norm VK4NP to Windsor School, Harry VK4ZHM to Ascot School, Royce VK4ZRH to Dutton Park Deaf School, Merv VK4ZMJ to Camp Hill School and Malcolm VK4ZEL checked Morningside School later.

Department approval to pass third party traffic was arranged by Eddie VK4OW and soon there were many messages about people, food, clothing and bedding.

At 5.15 p.m., an urgent call was made by Dave VK4HW at Mt. Crosby, some six miles north of Ipswich, the pumping and treatment works for the water supply for Brisbane and Ipswich and some surrounding areas. The works were in grave danger of flooding and contact with Brisbane City engineers in Brisbane had been lost. Roy arranged a phone patch and regular calls on this network to the Flood Control Centre became standard operation at all hours for several days.

Channel B traffic stopped immediately as operators realised the gravity of the situation. Men were working to keep intake motors going at the bottom of 90 ft. deep wells while floodwaters seeped through the concrete walls down onto them. Essential power to the station failed at one time. Warren VK4GT at Ipswich was the link with the Southern Electric Authority to get power restored before excessive damage was caused. Dave operated his Pye Overland from his car. The link also arranged for helicopter lifts of workmen and essential oil for bearings in subsequent days.

At 6 p.m. on Sunday, CD HQ advised that the situation was so serious that the amateur network might be required for 72 hours and reliefs should be arranged. This was done by Roy with a number of operators on standby and others manning schools not occupied released to go home.

At this time, contact was established with some of the major isolated flooded areas. Lew VK4ZLL was at Wacol, George VK4ZLG at Inala, John VK4ZXS at Gailes, Brian VK4CCR at Leichhardt, Ipswich, and Warren VK4GT and Wayne VK4ZN at Ipswich.

BELOW: LEW, VK4ZLL

LEFT: DON,VK4ZAF

So a very flexible network covering 20 miles of the Brisbane River Valley was set up entirely by amateurs under their control. More than half used transistorised units capable of long operation from battery supplies. In contrast, it seemed the CD network consisted of eight units, not all operating, a number of hand-held 27MHz units and access to Army back pack radios.

Amateur HF was considered not suitable for the restricted area.

Squally rain continued over the area and many operators got wet from above and also below as floodwaters continued to rise. I was tramping more mud on to my car carpets with every message. Ugh!

But thousands of people were having their homes inundated and covered so we couldn't complain. The CD emphasis was to save lives, not to worry about property and this was the priority at all times.

One exception was a request from Ray VK4ZBR to Henry VK4ZHK and John VK4ZJM (both students) to enter the South Brisbane Technical College. In a couple of hours, they shifted communications and test equipment worth $200,000 well above the eventual flood level.

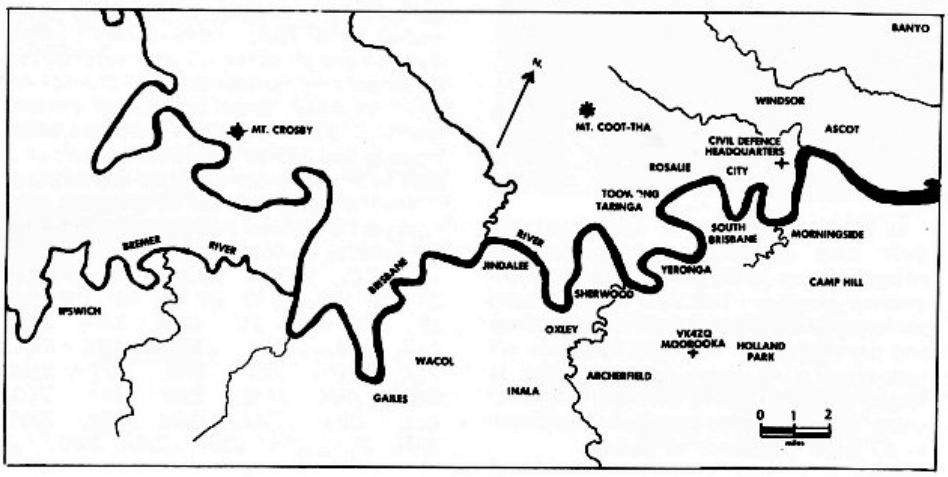
As Channel B traffic increased, Malcolm VK4ZEL set up a limited group on Channel A. Gary VK4ZGT came in from taking flood levels to CD HQ to receive Channel A, and Graham VK4ZTS took my place around 1 o'clock on Monday morning in my now very muddy car while I tried to sleep in the back of his car.

Malcolm VK4ZEL relieved Roy in the early a.m. and also took over as base several times when Roy called on his battery powered half watt unit to advise of mains power failures.

By Monday daylight (the Australia Day holiday!) the network was very busy in the confusion. The Brisbane River had reached 17 ft. at the port office gauge (normally 8 ft. on a king tide) and further rises were expected on tidal peaks.

At places like Goodna, the rise was 60 ft. People were still being evacuated and squally rain was continuing to add to the general discomfort.

Ray VK4ZBR and John VK4IE were active in the Sherwood area. Ray sat at the Sherwood police station when their phone and police receiver went out. He later went maritime mobile with John's hand-held unit to reach the Oxley school where a large number of people were sheltering.



One message sought permission to use a bulldozer to knock down panels of the school fence for an access for relief trucks. Permission was granted.

Paul VK4ZBV who earlier had been maritime mobile at Yeronga reported the needs for 30 dereiicts and others evacuated to the Brisbane State High School. Harvey VK4ZHW and Tony VK4ZMA relieved Peter VK4ZWP and Stephen VK4ZHW at the Rosalie Convent relief centre where 60 people were being fed and housed.

George VK4ZLG, Lew VK4ZLL and John VK4ZXS were all active in their isolated areas, Lew on his modified Pye Victor becoming in effect the district CD organiser. At one stage, he reported leaking acetylene from a gas making plant under water. Then this mixed with fumes of petrol leaking from a flooded service station nearby! He also commandeered an Army personnel carrier to get 40 gallons of milk and 600 loaves of bread from the Wacol prison for distribution to the Wacol camp area, parts of Oxley and later parts of Jindalee.

Eddie VK4OW worked with CD rescue teams in the New Farm area as did David VK4ZF. Col VK4ZHN checked the needs of 200 people from the Pinkenba-Cribb Island area evacuated to the Banyo Seminary.

Continuously, there were demands on the movement of people, numbers, the despatch of food and clothing, reports of dangers like wires going under water, flood heights relative to well known spots and so on until details became a blur in the minds of the operators and but a piece of paper in the pile of message forms at CD HQ.

Certainly there were delays while decisions were made. But the network also carried first class advice on requests for things like soyabean milk and formula milk for babies in need. Then there were mattresses, what to do with extra food, requests for relief CD volunteers, etc. And so the hours passed, the river reaching 19 ft. around 1 p.m.

In the afternoon, Rod VK4RA at the Archerfield light aerodrome, George VK4ZLG at Inala, Lew VK4ZLL at Wacol and base Roy VK4ZQ co-ordinated to arrange for food drops from three light aircraft. The drops were successful.

Stephen VK4ZHW manned a boat for search and rescue work in the Milton area. Then came a call for help in the South Brisbane area on the opposite side of the river. Channel B was cleared and Stephen had key down to give all a broadcast of his swift crossing past the William Jolly Bridge to the southside. The river was flowing around 15 knots.

Alan VK4ZAW was also maritime mobile in the Fairfield-Yeronga areas. He was then recalled to Moorooka police station and got to the water again at Morningside.

The net continued to change as people went to work and others called in. Snow VK4NR called in from two relief centres

at Salisbury and another at Sunnybank. Graham VK2ZZV mobile, Jack WA6MUT/VK4 on the ship Canada Bear in port, and Bruce VK3BM were visitors to offer their services.

While my relief Graham VK4ZTS slept at home, I had breaks from the microphone for CD supplied coffee and food thanks to Gary VK4ZGT. Somehow, Roy VK4ZQ managed to keep a tab on everyone. A run through of the net occasionally checked the details. There were never fewer than six on the air even in the middle of the night with another six or seven on standby.

By late Monday, the weather improved but the flood was rising.

Graham VK4ZTS relieved me at 7 p.m. when the traffic had eased. But Graham's turn was yet to come. He had to go mobile in the night to find two CD teams in the Toowong area. He found them but then came across 70 old bed-ridden people who had been evacuated to a church hall. There were no proper toilets and they were lying in wet beds. Graham co-ordinated their further evacuation to the Bardon Convent. He was relieved there by saving Roy relaying. CD message forms with carbons were then in use since it was realised some earlier messages had been lost in the CD HQ system.

The Brisbane River reached a peak of 21 ft. 7 ins. around 2 a.m.

In the morning, Ray VK4ZKI called in from the isolated Jindalee area after I sent Graham VK4ZTS home to bed. He endeavoured to clear some traffic to and from the area but authorities were non-co-operative as a result of some unfounded reports on commercial radio they thought had originated from amateurs.

With the river level falling, CD traffic eased. Gary VK4ZGT took over from me at 8.15 a.m. The net was disbanded at 4 p.m. when the sun was shining.

Roy continued to keep contact with Dave VK4HW for another two days. Fred VK4ZHF, Malcolm VK4ZEL, Alan VK4ZAW and Roy VK4ZQ using VK4YC, the call of the Yeronga Technical College, later operated on Channel B for nine days with department approval keeping contact among technical colleges. They co-ordinated flood equipment clean-ups as telephones were out.

BELOW: DAVE, VK4HW

Ross VK4ZFD who had been working in his St. Lucia area.

During the night, CD signals section was moved to the cleared top floor of the two-storey CD HQ, formerly a school. My equipment was moved out of my car to a special cubicle. The curly whip ended up on a makeshift ground plane above an extension ladder on the roof. Direct communication with some distant stations resulted

In short, more than 50 operators gave their time equipment, experience and common sense in the best traditions of the amateur service. This was despite much personal inconvenience lack of food, sleep and dry clothes. It was a 48 hours we will remember, a 48 hours we would like to forget, and a 48 hours we hope will never come again to cause so much heartbreak to so many thousands of people.

A meeting of some of the operators involved considered the emergency net in retrospect. Fortunately, the disaster occurred on a holiday week-end when many operators were home and on the channel. It would be more difficult to arrange during the week. The arrangement used was considered the most effective, i.e., a relay station at CD headquarters and a favourably placed home base station. This enabled only essential traffic to be handled at CD HQ. The HQ is not well sited for VHF communication. A portable base station at Mt. Coot-tha with access to emergency power at one of the TV stations might be an alternative. Vertical polarisation was the key to success. All stations should have two channels at least. A number of multi-channel units on the air were fitted with only one crystal. The extra channel could be a repeater. Each station should find out which sub-station his power comes from and which exchange his telephone comes from. Many operators were fortunate phone communication continued during the flood. A list should be compiled of all operators owning trailer power boats from which they could work

Amateur operators were advantaged by operating their own equipment knowing its readiness, reliability and limits, working with familiar voices and calls within the amateur organisation yet providing communication for CD HQ. With our numbers, there was an operator in most flood affected areas who knew his area and worked there. Most worthy of praise is the fact not one equipment breakdown affected the net over the two days.

Amateurs were disadvantaged working with people who believed the hysterical reports on open line programmes broadcast on commercial radio without checking. Also some statements were made on information many hours old, e.g., 200 people needing rescue at Fairfield when they had reached safety.

Amateurs need some official identification pass for authorities like police so they can operate effectively in emergencies and also some identification of their mobiles There is also a need for authorities to appreciate the extent and reliability of amateur communication on VHF. Many professionals directly or indirectly connected with radio communication were involved and all operators were experienced on air as they operate the year round. An effort by local, State or Federal governments to assist amateurs purchase extra crystals and set up repeaters to be available in emergencies would be appreciated.

The following is a list of operators who took part or offered their services and were on standby during the emergency:

VK2ZZV, VK3BM, WA6MUT/VK4, VK4's GT, GV, HW, IE, IO, LS, NP, NR, OW, RA, ZF, ZN, ZQ, ZV, CCR, ZAA, ZAD, ZAF, ZAL, ZAW, ZBR, ZBV, ZCL, ZDC, ZDY, ZEL, ZFD, ZGT, ZHK, ZHM, ZHN, ZHW, ZJM, ZKI, ZLG, ZLL, ZMA, ZMJ, ZML, ZMV, ZNH, ZRH, ZSH, ZTS, ZWP, ZXS, ZZG. ●

Additional Band Coverage for the Heathkit HW32A

ROSS GREENAWAY, VK6DA
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Leederville, W.A., 6007.

The following is a simple, cheap, but very effective way to modify the Heathkit HW32A. The big disadvantage with the original model is that it covers only the American phone band—14 200 to 14 350kHz, leaving a very desirable portion of the band unworkable. Here's how to cover the rest of the band without altering calibration or delving too much into the innards or disfiguring the front panel.

Firstly purchase an additional crystal (18,122kHz). You will also need a slide switch (DPDT), a couple of nuts and bolts, a solder lug, and a bicycle spoke.

Unsolder the present crystal from the right hand front corner of the PC board. Drill and file a suitable hole in the right hand chassis end, making sure that the hole is of sufficient size to allow full movement of the switch slide, which will project through the chassis.

Before mounting the switch in position, bend the outside lugs at right angles as shown in Fig 3 and solder the two crystals into position. It is easier at this stage to connect two short lengths of wire to the centre lugs of the switch. These will be connected to the two holes in the PC board from which the original crystal was taken.

When mounting the switch to the chassis, clamp a solder lug beneath the head of the switch mounting screw nearest the front panel.

Take the bike spoke, Fig 2, and after allowing half an inch to protrude through the front panel, bend the unthreaded end to form an eye which should fit neatly around the slide portion of the switch. Take care in aligning the spoke along the outside of the chassis and drill a hole in the front panel so that the spoke is a neat sliding fit.

Little now remains except to slip the "eye" of the spoke over the part of the switch which protrudes through the chassis Fig 3. It is held in position by the solder lug (previously clamped under the mounting screw) which is bent at its outer end to allow the spoke to slide easily. The threaded end of the spoke which protrudes from the front panel is "decorated" with the spoke nipple or small knob from the junk box and the modification is complete.

The dial need not be interfered with as it is easy to interpolate or estimate counting backwards. 14 350 becomes 14 200 with the switch in the "additional band" position. If you are really keen, there is nothing to stop you adding a new set of figures. perhaps in a different colour. ●

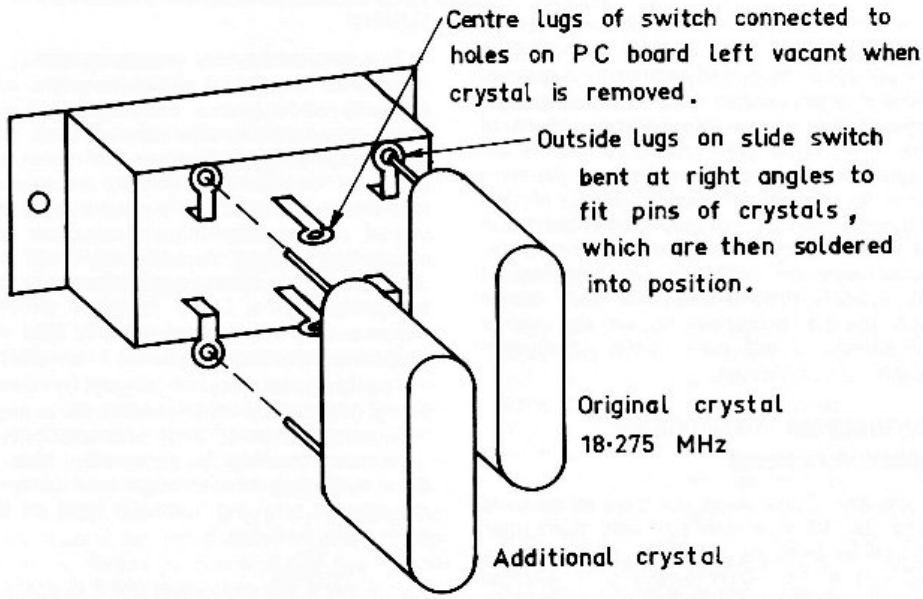


FIG 1 REAR VIEW OF SLIDE SWITCH

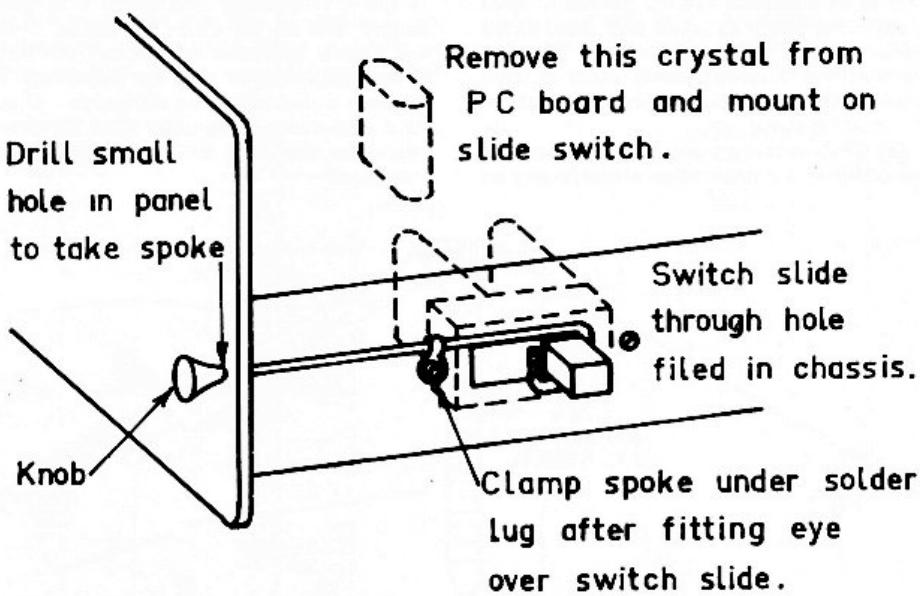


FIG 3 SHOWING MOUNTING OF SLIDE SWITCH AND CRYSTALS

FIG 2 SWITCH ROD - SEE TEXT

Some Thoughts on the G5RV

MAURIE EVERED, VK3AVO
13 Sage Street,
Oakleigh, 3166.

The theory of the G5RV antenna was discussed in detail by "The Man Himself" in AR January, 1973. This article, based on the author's experience, deals with some pratical aspects of its use.

A G5RV has been used at this QTH for over four years for both local and DX work on all bands from 160 metres to 2 metres. What follows is intended to help anyone who wishes to use this antenna. Much of the information given is not found in the usual texts but has been learned the hard way by many amateurs. Most of the methods used are not original but the result of helpful advice from many other VK's, particularly Vin, VK3AOV who suggested I try a G5RV after a coax fed multi dipole had proved disappointing on the higher HF bands. I will present the information under four headings.

CORRECTING THE POPULAR MISCONCEPTIONS

(a) The G5RV does not have to be used with its 102 ft length perfectly horizontal. It can be used in a sloping configuration, as it is at this QTH (see Fig 1) with no loss of efficiency (although some cancellation may occur if the angle of depression from the horizontal becomes too large.)

(b) The length of coax cable used does seem to be important. Most operators who successfully use the G5RV have been able to confine the length of coax to less than 30 ft. Conversely, greater lengths (more than 50 ft) may lead to poorer performance. This is an empirical finding arrived at after questioning many satisfied and dissatisfied users over a four year period. Despite the fact that if good quality coax is used losses should not be severe, at least on the lower frequencies.

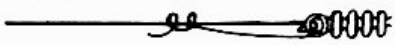
(c) Often amateurs are heard to say that the G5RV is a compromise antenna and so must perform poorly in some respects. (No reasons are ever given, just the statement!) This is not so in practice. After all, the G5RV is no more a compromise than any other multiband antenna (even the mighty TH6!).

TUNING

This is probably the greatest bugbear in the use of the G5RV and the reason why many operators give it away as a bad job. They are faced initially with an SWR that is considered too high or a transmitter that will not load satisfactorily and, therefore assume that the only answer is in the use of an antenna tuning unit or the use of another type of antenna. I would not recommend the use of a tuning unit or the scrapping of the G5RV in these circumstances, and the method used to tune my particular antenna when it was first erected.

The antenna is tuned simply by shortening (but not by cutting) until an acceptable combination of SWR and satisfactory transmitter loading is achieved. This is done by pulling wire through each terminal insulator in turn and folding it back on the main wire (see Fig 2).

FIG.2.



TUNING ADJUSTMENT.
(TAPE SECURELY WHEN FINALISED.)

Do this in steps of about six inches at a time and test after each adjustment. Concentrate first on the 20 metre band (say at 14 180 - 14 300kHz) and when it is satisfactory, test on the other HF bands. These will usually be found satisfactory but some further adjustments may be necessary for the best compromise on all bands. If you have a favourite band other than 20 metres adjust for the best SWR and loading on that band.

I obtained the following results:—

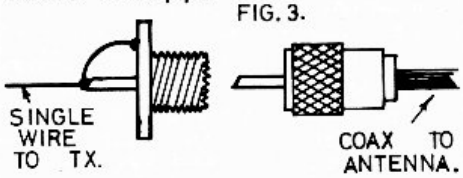
BAND	SWR
80 metres	1.3
40 metres	1.6
20 metres	1.0 - 1.1
15 metres	1.6
10 metres	4.0

With this method of tuning the full original length of wire is left in case the antenna configuration is changed, or in case you change QTH. Both could require checking and probable readjustment.

USE ON 160 METRES AS A LOADED VERTICAL

I was able to load the G5RV satisfactorily on 160 metres by simply joining the two conductors of the coax feeder and then running a single wire to the pi-out put of a small 10 watt AM Transmitter (See Fig 3). A buried earth wire was run to the nearest water pipe.

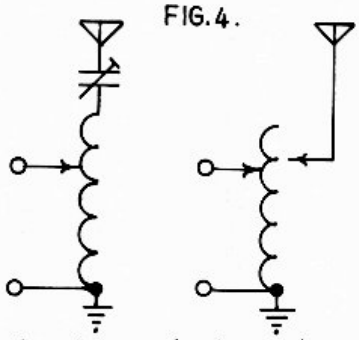
FIG. 3.



FEMALE AND MALE COAX CONNECTORS.
(ANY CONVENIENT TYPE.)

With this combination lots of local and interstate contacts were made. Strangely, in this case the addition of series inductance or capacitance had very little effect on performance. Nevertheless, some operators find it worthwhile to feed the antenna on this band via a series tuned circuit or to use a tapped inductor (See Fig 4).

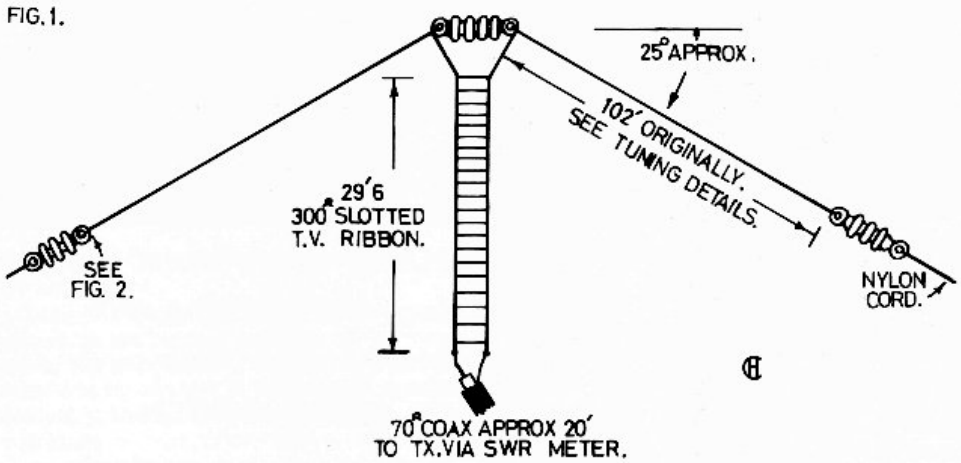
FIG. 4.



Needless to say the better the earth system used the better any such vertical antenna will perform.

An elementary yet often overlooked point in resonating such an antenna was brought to my notice by Lin, VK3ARL who suggested first peaking whatever tuning arrangement is used by listening to a strong (but not overpowering) signal and watching the

FIG. 1.



receiver S meter. Though the tuning position may not always coincide with that for best transmission it will be close enough to assist greatly in preliminary adjustments.

Opinions vary as to the best way of getting optium results on transmission. Antenna current measurements are fine provided that any tuning changes do not alter the impedance at the point of meter insertion. I used a simple field strength meter but any changes are best supported by a local amateur with a reliable S meter. Don, VK3ADP and Ron, VK3OM obliged on many occasions.

USE AT VHF

Although it is generally not considered a VHF antenna interesting effects can be obtained because the G5RV is several wavelengths long at these frequencies (particularly at two metres) and is bi-directional

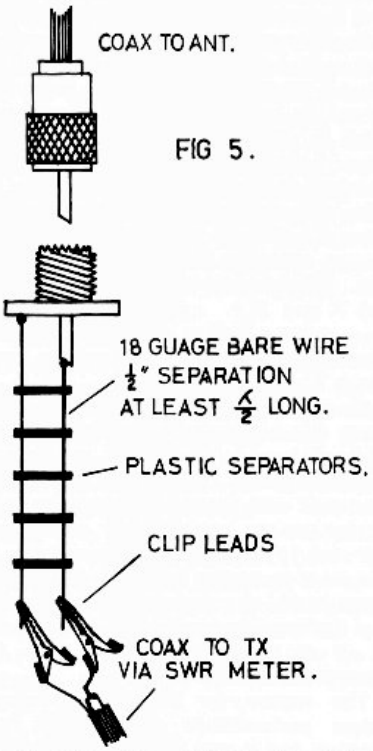


FIG 5.

off its ends. The antenna was fed as in Fig 5. Clip leads are slid up and down the parallel wires until a low impedance point is found. This gives a low SWR on the coax line to the transmitter. A tuning unit could of course be used but the method shown is very simple, very cheap, and most important, very effective.

Six metre testing was rather restricted but extensive tests were permormed on two metres on chanel B using an FT 2F-B. Very satisfactory results were obtained, stations being worked across the city when using the one watt output position.

Well, there it is. I would never claim that on 20, 15 or 10 metres a G5RV would equal or even approach the performance of a well adjusted quad or yagi, but I have tried quite a few wire antennas and, of these, I think the G5RV is out on its own for overall performance, size and ease of erection and adjustment. ●

A Success Story - Japanese Amateur Radio

By W. G. FRANCIS, VK3ASV
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It is now over two years since the writer started to investigate the granting of Novice Licences in different countries around the World. He found that the United States of America had a total of all classes of amateur operators of 265 000 approximately and declining slightly, with Japan next with just over 150 000 and numbers climbing rapidly.

The sharp increase in the number of Japanese licences is attributed to the popularity of the all phone, all bands, low power, 4th class licence—and through the encouragement of training programs provided by large electrical companies and the Japanese Amateur Radio League.

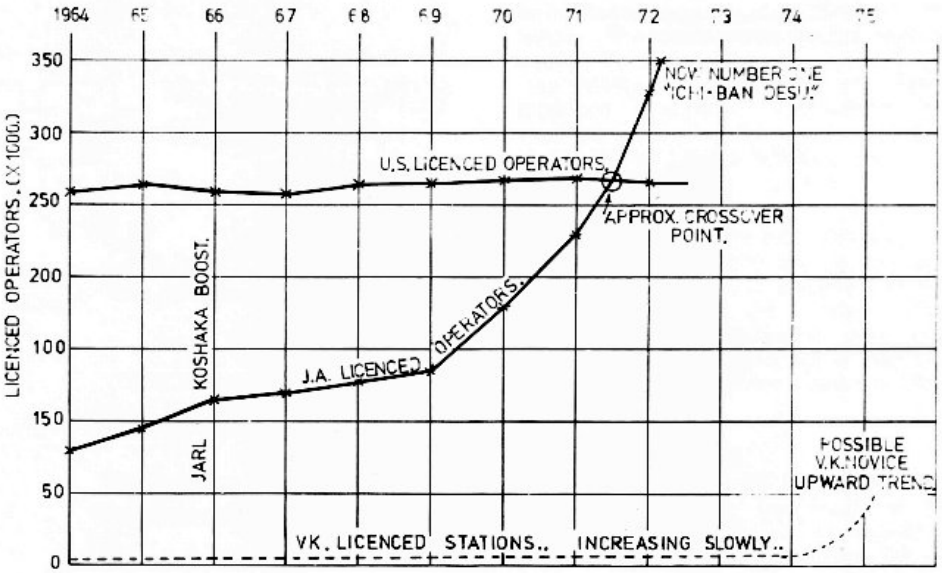
At that time, two years ago, it was not uncommon for the number of newly licenced amateurs to reach **8 000 per month** which is **1 500 more than the static amateur population of Australia.** It looked likely that at the rate of increase Japan would pass the United States in the number of licences amateur radio operators during 1972. Some amateurs here in Australia were sceptical that amateur radio would prove so popular in Japan.

The United States of America introduced Incentive Licensing in this general period, and it is thought that this has inhibited the expansion of amateur radio numbers in that country. The accompanying graph shows that in actual fact the Japanese did pass the Americans between 1972 and 1973 as predicted several years earlier. America has now a relatively stable amateur population of 250 000 and Japan has an approximate current amateur population of a third of a million — and steadily increasing. It should be noted that in Japan 86% of all licencees are Novices, whereas in the U.S.A. the Novices account for about 10%.

Up until May 1973 the MPT—Ministry of Post and Telecommunication of Japan—did not allow 2 metre FM repeaters or the transmitting of slow scan television. On May 10th the MPT started to grant SSTV permits on the HF bands. At least 25 amateurs have taken out permits.

The 15th National Convention of the JARL was held on the 27th May in the Kanto District. **It is interesting to note that Japan has no reciprocal licensing agreement with any country** and neither the JARL or the MPT are interested in such agreements at this time.

In 1971 there were 2 998 1st class operators, 12 237 2nd class operators, 21 253 CW novice operators, and 232 579 Phone only novice operators, totalling 269 067 operators, and 139 400 stations licenced. Not all amateurs own their own station because of the expense and consequently operate JARL or Company Radio Club Stations. ●



an a.r. special

The Belcom Liner 2 SSB Transceiver

The **Belcom Liner 2** is a fully solid state SSB transceiver which, although designed and styled for use in a mobile configuration is also a very useful home station transceiver.

Covering any 240kHz segment of the 144MHz band, this unit is rated at 20 watts PEP input on SSB. The actual power output measured on a wattmeter is of the order of 6 to 7 watts, varying considerably with supply volts in the manner typical of solid state power stages. This power level is quite suitable as input to a high power amplifier.

The standard frequency range is 144.1 to 144.33MHz, but this is altered simply by inserting a different crystal in the 38MHz oscillator. Optional crystals supplied with the unit gave 240kHz bands starting at 144.0, 144.24, and 145.8MHz. This last band is one which covers the Oscar 6 uplink band 145.9 to 146.0MHz.

The main electrical feature of the unit is the method used to obtain continuous coverage over the 240kHz range, using switched crystals and a VXO.

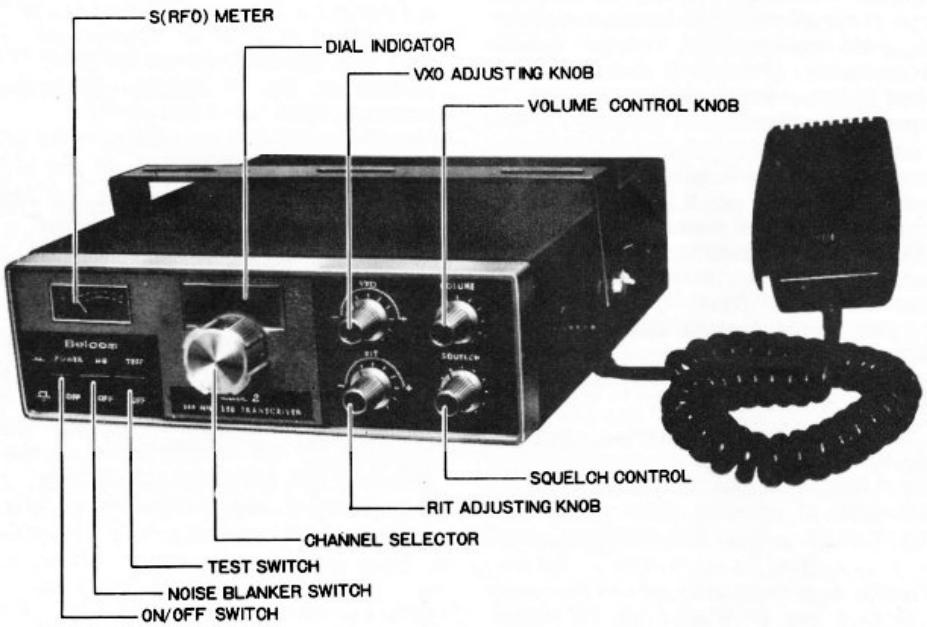
Instead of using a VFO, two crystal oscillators are used in what the handbook calls a **synthesiser** circuit to produce a variable injection signal at around 20.21 MHz. One oscillator has a choice of 4 crystals separated by 10kHz and the other has a choice of 6 crystals separated by 40kHz. The 24 different combinations of these 10 crystals thus are able to provide 24 channels spaced 10kHz apart. The outputs of the two oscillators are mixed and the sum frequency is selected as the **synthesiser** output.

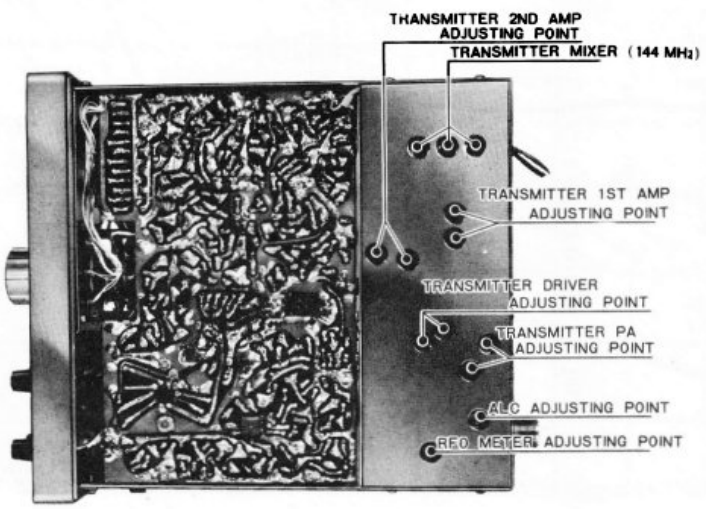
The synthesised 20MHz VFO and the SSB on 7.8MHz are then mixed to produce 28MHz SSB; this is then mixed with 115 MHz energy from a VXO on 38.5MHz to produce the final output on 144MHz. The VXO is capable of providing a shift of about 6kHz about each **channel** frequency, so effectively continuous coverage is possible.

Using the 39.1MHz crystal supplied as an option to give an operating band of 145.8 to 146.03MHz, a demonstration of Oscar 6 was arranged by the author for a meeting of the ACT Division of the WIA. Using this set **barefoot** and a 5 element beam it was easy to show that this power level is adequate to work through the satellite. Stations worked were in VK2, 3, 5 and 7 and ZL1. Later it was found that even using a simple quarter wave antenna it was quite easy to have contacts through Oscar 6 with this set.

Several VK1 stations have been worked using this set in the transceive mode. In addition, reports have been received from stations further afield. The receiver performance was found to be lacking in sensitivity, as the specification of 0.5 microvolt for 10 db S/N would indicate. (At this level most FM receivers are providing some 20 db of quieting). Lab tests indicate that the receiver has an overall noise figure of 12 db; in short—a good case for a **good** pre-amplifier.

The reason for the disappointing receiver performance specification is not obvious, but it may well be linked with the fact that this set is intended to be used in a mobile situation, where noise is probably the limiting factor. Whereas a noise blanker can be expected to effectively wipe out all noise from one main noise source, it is quite hopeless to try to remove a virtually constant background of the electrical noises that are present when operating mobile on VHF. Thus this receiver sensitivity may have been allowed to stay low deliberately.





OTHER FEATURES AND TEST RESULTS IN BRIEF

Meter provides S units on receive and output power on transmit. S meter readings are believeable, as it takes 75 microvolts to make it read S9 and you cannot make it reach full scale deflection (marked **S9 plus 30).**

Noise Blanker is selected by a push button on the front panel: this was found to

be very effective, even in a location at a traffic-lights intersection (lots of ignition noise).

Full carrier output for test purposes is provided by one of the push buttons on the front panel (used by the author to obtain CW with the mike button!).

Receiver Incremental Tuning which provides several kHz of offset from transmit frequency for the receiver only. Works well.

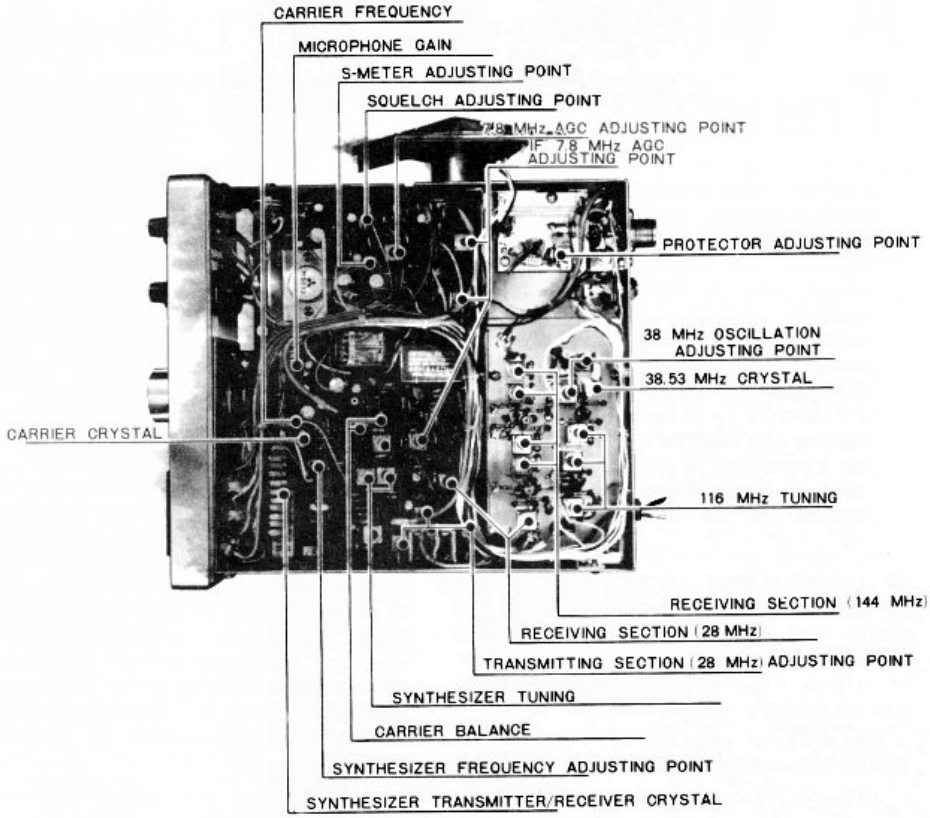
Squelch for fixed channel operation. Quite sensitive.

....**Calibration accuracy**... The absolute frequency depends on the setting of the VXO control, but the frequency difference between **channels** was found to be within about 150Hz of the specified 10kHz.

Weight 3 kg, dimensions (WxHxD) 220 x 70 x 250 mm (8¼" x 2¾" x 10").

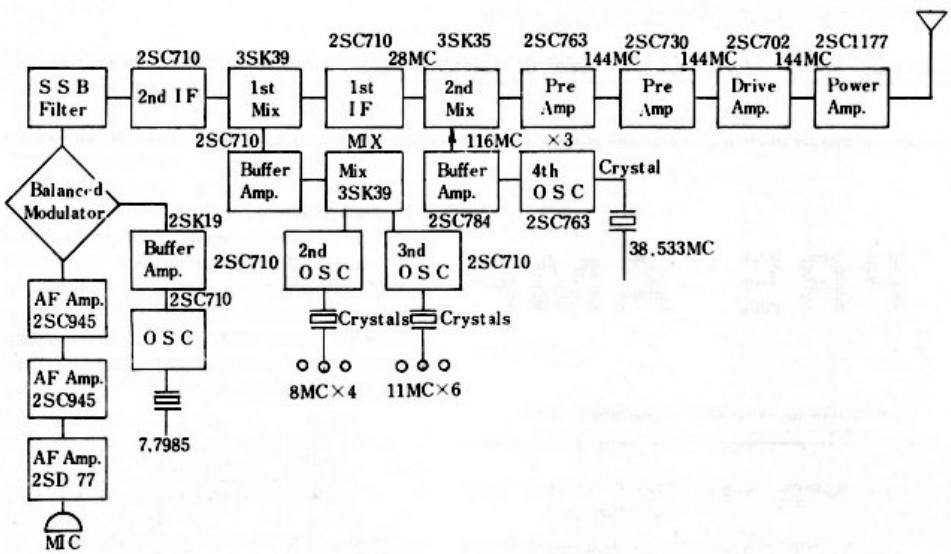
The Belcom Liner 2 uses 27 transistors, 6 FETs, 1 IC and 44 diodes. The input DC supply connector is polarised, and the line is fused, so that if the supply is wrongly connected for polarity, the reversed diode in the set will blow the fuse, protecting the active devices from damage. All controls were found to be easy to use and sensibly placed. For example, the (receiver audio) VOLUME control is the top right control, so that it falls easily to hand. Some mental gymnastics are needed to calculate the final frequency when first using a non-standard VXO crystal, but that is not too serious.

Examination of the circuit diagram reveals liberal use of double and even triple tuned circuits in mixer outputs. By all the indications, the claimed spurious suppression of 60 db is probably met. Certainly there were no outputs in the 144MHz band, other than the expected one, when testing the transmitter. The receiver was found to be a little worse, with a threshold effect occuring at about 1 millivolt: past this level there ware several **birdies** in the band. As not too many signals are that strong, that might not give any trouble. This problem may be caused by one of the switching diodes (over 30 of them) causing distortion or harmonics, and is one point to watch when installing a pre-amplifier. This problem is rarely, if ever, investigated when a pre-amplifier is installed in an FM **Carphone.** How many sets suddenly develop birdies when the pre-amp is added?



While evaluating this set, the costs of the various methods of getting onto the 144MHz band on SSB were compared. Assuming that one is keen enough to want permanent facilities on the band, the usual method used, namely an HF transceiver with a transverter to 144MHz would involve an outlay of at least the cost of the HF set, or between about $350 and $600. Compared to that is this set which provides instant 144MHz SSB at reasonable power level, and uses considerably less space in your shack; you also get mobile operation (fox hunts, field days, etc) as a bonus. With the popularity of VHF **tunable** operation on the increase, sets such as this one will become more widely used.

The set comes complete with 2 power leads, PTT mike, mike clip, mobile mounting bracket, English manual (very clear and informative) and spare fuses and dial lamps. The crystals needed for coverage outside the standard frequency range are also readily available form the dealer, Sideband Electronics Engineering, who supplied the set for this review. The price of the Belcom Liner 2 is $250.



SUMMARY

An excellent mobile SSB set, and ideal for the keen VHF operator to use as a driver for a high power amplifier; an easy way of getting onto the 2 metre satellite band with SSB. Pricewise, quite comparable to the **other method** of transceiving on 2m SSB on a dedicated equipment basis.

ACKNOWLEDGMENT

The assistance of Ed Penikis VK1VP in providing laboratory evaluation of this equipment is gratefully acknowledged.

VK1DA. ●

A Broad Band Travelling Wave Dipole

Dr. R. J. F. GUERTLER
and G. E. COLLYER
Antenna Engineering Aust. Pty. Ltd., Melb.

A dipole can be modified by inserting resistive loading networks so as to produce standing waves between the feedpoint and the networks. The authors have by adjustment of the networks and the dipole sections developed a travelling wave dipole whose VSWR is less than 2:1 from 3 to 15MHz and does not exceed 2.6 to 1 from 2.3 to at least 30MHz. This antenna can thus be used on 6 amateur bands and is an affective alternative to the well-known G5RV, the Windom, and the end fed Hertz.

The dipole was designed for short-haul HF communication systems and is supported in a horizontal position between two masts. The feed point impedance provides a good match to a 300 ohm balanced line, or may be matched to a 50 ohm coaxial line by means of a balun.

The antenna consists of four sections and is symmetrical. Firstly there is a 12.1m length of two wire line spaced 1.8m apart by means of two 25mm diameter aluminium tubes. The wire is 7 strands of 1.2mm diameter copper. A tapering section of 1.25m brings these wires together at the feed-point. At the other end of the open wire section there is a network which connects to another section of open wire line 6.4m long. The network consists of a 16uH indicator in parallel with a 330 ohm resistor and takes up a length of 0.45m. Overall the antenna is 40.6m long.

It was found that neither the value of the 330 ohm resistors nor that of the shunt inductors was very critical. The shunt inductor has a small effect on SWR at the lower frequency end. However, reduction of the resistance to 150 ohms caused the SWR to fluctuate considerably with frequency. The taper sections were required to reduce shunt capacity between the spreaders M and P. Reducing the length of this section produced an increase in SWR.

The construction details of the antenna are shown in Fig 1 and details of its performance are given in Figs 2 and 3.

The authors presented a paper on this antenna at the recent IREE convention held in August, 1973, in Melbourne. Further details are given in the Convention Digest which contains a two page synopsis of all papers presented. This digest is available from the offices of the IREE at a cost of $5 for non-members and $4 for members. Enquiries may be made by telephoning Melbourne 347-2627, or by writing to the IREE Melbourne Branch at 191 Royal Parade, Parkville, 3052.

The permission of the IREE and of the authors to publish this precis is gratefully acknowledged.

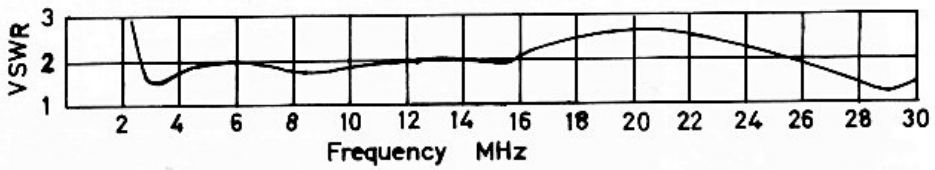


Fig 2 VSWR MAGNITUDE VS FREQUENCY

FIG 3 Smith Chart representation of VSWR vs Frequency

NOTE: X,V,Q,M,P,U,W,Y 25mm diameter aluminium tubes

Fig 1 CONSTRUCTION OF THE TRAVELLING WAVE DIPOLE

146 MHz PRE-AMP

Reprint—GARC Newsletter—November, 1972

This Pre-amp uses the inexpensive MPF121 Dual Gate FET. You will note that no neutralization is required and therefore it is very easy to construct and to get going.

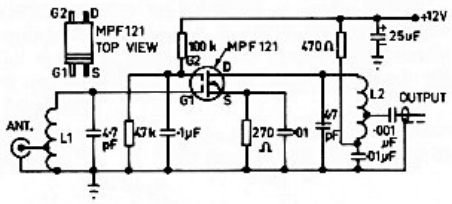
L1 approx, 4½T Tapped at 1½ from earth end.

L2 approx. 4½T Tapped at 2½ from 470 ohm end.

Both coils are wound on Neosid formers with slugs fitted.

TUNING UP

Use a weak signal and peak L1 & L2 for maximum Limiter voltage on an FM rig, or S meter on an AM rig. If there is any instability noted, shield L1 & L2, and place a small value (about 1 or 2 mfd electro or tantalum) of extra capacity across the .1mf on the 2nd Gate to earth.



Is Amateur Radio Necessary?

Reprint from the Australian EEB, February, 1973

A: Have another beer.
B: Don't mind if I do.
A: What are your thoughts on Repeaters?
B: All in favour of them. You fellows are squeezing into less and less space.
A: Well that's good isn't it? We're using the bands more efficiently.
B: Yes it certainly is good. There are a lot of other chaps who want that space, and it looks as though they ought to have it.
A: Oh?
B: You realise, say, that 80 metres is ideal for people doing work in the outback?
A: But why 80 m. Why not 81 m?
B: All right but **they** want 80 m, and the equipment is already commercially available.
A: But we have already got plenty of amateurs on 80; just listen to the QRM any week-end.
B: But how dead is it during the week? And what is to prevent you from doing all your operating with VHF repeaters? You could get nearly as much DX from a chain of repeaters as you get from 80 metres.
A: But that's not fair! A lot of blokes prefer to build HF equipment which is less critical of components and adjustments than is VHF gear.
B: Oh yes, and how many people do build their own any more?
A: Plenty; the amateur magazines are full of constructional articles.
B: Do you build?
A: Well no, but that's a special case; I've just got too much to do for the wife and my job.
B: It's not so special; when more people were constructing they were just as busy. But let's return to the original point. You chaps have already lost a large slice of 80 to commercials who do in fact use it constructively. You can hardly assert that most of amateur operation is constructive nowadays. Furthermore repeaters show that you can operate on much less space than you have been given. Why, for instance, should you have 4MHz on 2 metres when in fact you produce the most activity there from FM contacts using some 3MHz largely unoccupied.
A: But the low end is certainly occupied very heavily by AM, etc.
B: Sure, some 200-300kHz worth; that's heavy?
A: We have to plan for the future; more amateurs will need more frequencies.
B: The present channel spacing could be reduced, and more amateurs could be put into each channel.
A: This would turn amateur operation into one great net.
B: Isn't that the direction its going now?
A: How about individualists who don't want to be crowded in with the others?
B: Let's keep our priorities in mind. The important thing is not what amateurs want but what societies need.
A: I suppose that society "needs" space in 40 and 80 m while there is ample space available to them outside of our bands?
B: There is such space, but you must admit that the propaganda stations find a hand-picked audience already at hand in the amateur bands.
A: Amateurs are not intersted in propaganda!
B: Then why don't more of them jam the broadcasts of the Intruders? Only a tiny signal sitting on one of their frequencies can cause havoc.
A: Amateurs have more important things to do. The fact remains that the Intruders have no business being there; are you supporting their propaganda activity?
B: Certainly not. Arguments have in fact been advanced in favour of your having more space in 40 m, but this was opposed by the government of Infrabovia — with whom we are presumably on friendly terms. What more can be done?
A: At least we shouldn't lose the frequencies to which we are entitled.
B: **Are** you entitled to them?
A: Yes, we were given these frequencies by international agrement.
B: Modern tendencies toward band-sharing show that this agreement is no longer as valid.
A: But that's not fair!
B: So? What have amateurs done in recent times to justify their use of the bands?
A: Training new technical talent?
B: That's taken care of nicely by commercial and military training programmes.
A: Civil defence?
B: This is already handled very competently by governmental agencies.
A: Message handling?
B: Not significantly outside of North America, and look at the mess it has become over there. They are even phone patching commercial transactions now!
A: At least amateur radio provides a healthy hobby for a large number of people.
B: Have you listened to the bands recently?
A: Of course.
B: Do you call "healthy" the kind of obscenity, discourtesy, bad operating, and incompetent operating heard there?
A: That's only a noisy minority.
B: You can't convince the public of that.
A: (Smugly) Most of our operation is on SSB and the public can't receive that, so they don't matter.
B: The commercials can, and they do matter. And they want your frequencies. You have shown that with the aid of repeaters you can do with far smaller bands. You have shown by scanty use you need far fewer bands. And you have shown by incompetence and poor operating that you are jolly lucky to have any frequencies at all.
A: If you destroy radio you'll be destroying a large commercial enterprise.
B: Who's destroying radio? Only amateur radio; there is much commercial and service opportunity in other directions. Already component manufacturers are recognising this by largely ignoring amateur complaints about component scarcity. The big production goes where the big money is: In the entertainment and commercial communications markets.
A: (Gasp) I need another beer.
B: Me too. May I make a suggestion I hope you'll pass on to your mates. You'll have a better chance of keeping the bands if the intelligent majority accepts some responsibility for pulling the Clods back into line. This requires the individual responsibility, and that means you and your friends. If you do nothing, you'll get nothing. ●

UHF Dipper

EDWIN SCHOELL, VK5NZ

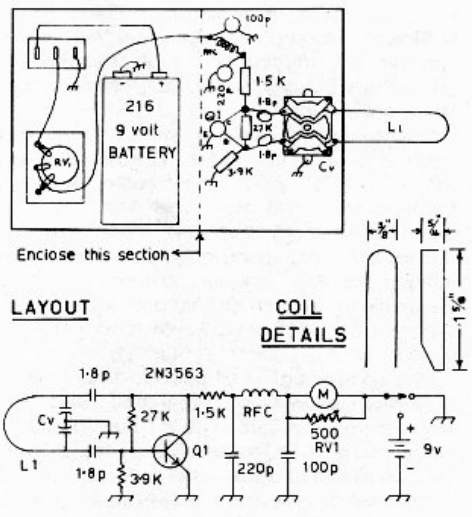
Reprinted from S.A. Journal, July 1971

The problem of tuning up and debugging 432MHz equipment is made a lot simpler by the use of the tuned circuit dipper.
This device was developed three or four years ago when interest was generated in 432, and has been used for that length of time in the 5NZ shack. It has been used to tune up several convertors, varactor multipliers, filters, aerials, transmitters, etc., since then.

If built as drawn, operation will be free of spurious dips and peaks, and will cover 270 to 475MHz.

This device was built on a bent piece of tin-plate, with the active circuitry built under the end of the U-shaped channel which is 1" high and 2⅞" wide. The battery, meter, and switch are enclosed with an L-shaped cover.

The tuning capacitor is one of the butterfly type used for many years by TCA in 1649's, 1674's, etc., for grid tuning of 3/12's and 3/20's.



One hint:—If you are thinking of building an expanded/extended array, you will need something like this dipper for tuning the phasing lines and balun. Calibration is done using Lecher Lines and a ruler.

See Section 19.12, R.S.G.B. Handbook.

Switching the device off converts it into a crude but effective wavemeter. If it is left on, and brought near a transmitter or oscillator a very sharp resonance check can be made by watching for a **flick** as the oscillator **locks on** to the external signal.

PARTS LIST

L1—As per drawing, made out of tin-plate.
Q1—2N3563 Epoxy Transistor.
RFC—17 turns No. 30 BS Enamel, ⅛" diameter closewound.
M1—100 micro-ampere meter. (e.g. Phillips 100 micro-amp. level meter).
RV1—500 ohm Trimpot or Tab-pot.
Resistors—¼ or ½ watt carbon.
Capacitors—Miniature creamics.
Cv—6.4 pf., Coded 82016/6EA, butterfly, ¾" x ⅝" ceramic Insulation. ●

Newcomers Notebook

with Rodney Champness VK3UG

44 Rathmullen Rd., Boronia, Vic., 3155

EQUIPMENT LAYOUT and DESIGN (Part 2)

Once the circuitry design has been finalised, either one of your own designs or one copied from a known good circuit, the important job of laying out the printed board or chassis must be undertaken. A good design on paper can easily turn into a *lemon* if due concern is not taken with the physical layout of the unit. Many a newcomer to electronics has become very discouraged when a new, perhaps expensive project in both time and money, fails to work at all well.

Why do many of the copies of known good designs fail to live up to expectations when you build them? Joe Blow's version down the street is so much better, you begin to wonder if you both built the equipment to the same circuit. Both are built from the same circuit, but the way that they were individually built supplies the answer, unless of course you were unlucky enough to get a few defective components. It is amazing the number of people who build some horrible device which refuses to work, who look at another device using the same design which does work well and cannot see anything different in the physical layout.

Usually the differences are very obvious — components of totally different characteristics or physical size have been used, or the layout bears no resemblance to the suggested original layout, inputs are located near outputs, there are earth loops in the wiring, or just that many of the wires do not go directly where they should and meander around the chassis.

If you look at someone else's equipment that works well you may get some idea on how a piece of equipment should be laid out so that various stages do not interfere with each other's operation. Each separate stage should not be interleaved with another. Each should be a separate entity, and should not be like a Siamese Twin — all mixed up together. However, once you know which circuits are compatible with one another — in other words, will work quite effectively intermingled with one another — you will know a lot about design both theoretically and practically. As a newcomer you will not necessarily know which are and which are not compatible, so keep each stage separated. Each stage of a piece of equipment should have its input and output as removed from each other as much as practical.

For example some people mount valve sockets so that the input signal wiring must cross over the socket, which means it goes very near to the output lug and wire on the socket. In each case the lead may have to be twice as long as it should be, and additionally the coupling between input and output may be so great that oscillation at some frequency occurs. If oscillation does not occur the characteristics of the stage may be so altered that the intended performance of the stage is never achieved, no matter what the newcomer may try. In some high gain valve stages a shield may have to be soldered across the valve socket isolating the input and output to prevent oscillation. This is likely to be necessary if, for instance, a 6EH7 is used as a 455kHz IF amplifier. This shield is earthed and connecting to the centre spigot.

Now having sorted out the problem of wiring a single stage, we move onto the laying out of several stages. Wherever possible each stage of a piece of equipment should be laid out in a straight line so that the input of the first stage is as far removed as possible from the output of the last stage. It is rather impractical however to lay out a 20 valve or transistor receiver in a straight line. The set would be rather long and thin, and who likes their receiver to measure 3' x 3" x 3"? This is where the knowledge of which stages of a piece of equipment are compatible with others becomes important. Consider a conventional valved receiver. The following stages are reasonably compatible with one another — RF or IF and Mixer stages can be placed near the power supply or audio output. They are all handling the flow of electrons in different ways. Succeeding IF stages should not be intermingled and should be laid out in a straight line along the chassis if possible. The second detector, whether an envelope or product detector, should be kept away from the audio output or the power supply and also the front end of the IF strip. The low level audio stages should not be near the power supply or audio output. The audio output can be placed close to the power supply as long as the power transformer and audio output transformer are well separated or are orientated such that the output transformer picks up no hum from the power transformer by direct magnetic coupling. All the filtering in the world will not remove the hum out of the audio if magnetic coupling is involved.

Low level audio stages and second detectors of receivers are very susceptible to hum due to direct pick up from heater leads or due to inadequate filtering of the high tension line. Keep the heater leads away from these sensitive audio or detector circuits. If insufficient filtering is the problem instal another R-C decoupling filter network to make the HT supply to the stage as near pure DC as possible.

Decoupling of various stages from one another is quite important. The heater lines, the HT lines, AGC line, audio negative feedback line and any other line which is common to more than one stage must be *decoupled*. Decoupling is purely a method of making any line common to more than one stage *clean* of any extraneous *signals*. For instance the AGC line should have pure DC applied to it — there should be no RF or Audio component at all upon it otherwise its performance will be degraded and the receiver may oscillate. The HT line should be as near to pure DC as possible. If the receiver local oscillator and the audio output stage are connected to the same point in the power supply it could be that the violent swings in current drawn by the output stage could cause the voltage to vary sufficiently to detune the local oscillator. This could be extremely annoying if SSB signals were being received. In fact this involuntary detuning of the oscillator is so much a problem that it is often supplied from a special supply section with a voltage regulator fitted. It may be necessary to supply the HT to a two stage IF strip through separate decoupling networks if the individual stage gain is high.

In transmitters similar problems arise, and they must be just as carefully laid out, if not more so, as a receiver. A transmitter that is badly laid out or designed is likely to radiate spurious signals — and these are just the things to get us into trouble with our neighbours and the authorities. The high level RF output sections should be kept well away from low level audio sections of the transmitter. RF getting into the audio section can cause all sorts of odd effects, such as distortion, feed-back, lower than expected audio output, etc.

The newcomer I anticipate will be building the simpler AM - CW - FM type transmitter with very few stages of RF or Audio. A CW transmitter is the simplest type of transmitter to build which will give good results. It is most desirable with transmitter RF stages, particularly when you are designing them for the HF bands, to fit parasitic suppressors to either the grids, screens or plates. A simple suppressor can consist of a 30 to 100 ohm resistor in the grid lead of a valve, or maybe a small ferrite bead. Screen leads usually have about 40 to 100 ohm resistors in series with them. The plate lead has much the same value of resistor which is usually a 1 watt unit with approximately 6 turns of wire wound over it connecting to either end of the resistor. Some at least of these should be fitted as a matter of course, as it is surprising the number of transmitters putting out energy on frequencies not related to the desired output. Your television set and a multiband receiver can be of assistance in tracing likely parasitics — although the exact method of tracing these parasitics and then curing them will have to be the subject of another article sometime in the future.

There is probably much that I could tell you about layout and design, but I believe that my job in this column is to show you the way to start on this problem and in fact to realise what the problems are. A particularly good book to read which will help considerably with the subjects discussed over the last two months is *Understanding Amateur Radio*, an ARRL publication. Another book which will help with fundamentals is *A Course in Radio Fundamentals* once again by the ARRL. Other recommended reading texts are, *The Radio Amateur's Handbook* ARRL, the *Radio Communication Handbook* RSGB, and *Basic Electronics* produced by *Electronics Australia*. All of these should be available from the bookshops who advertise in *Amateur Radio* and the Callbook. ●

ARRL National Convention.

Anyone likely to be in New York mid-July? Dee Logan WB2FBF invites anyone interested to attend the 1974 ARRL National Convention to be held at the Waldorf Astoria, New York City, from July 19th to 21st. The Convention is sponsored by the Hudson Amateur Radio Council Inc. and has the theme "International Friendship through Amateur Radio."

Commercial Kinks

with Ron Fisher VK3OM

3 Fairview Ave., Glen Waverley, 3150

I wonder how many Geloso G222 transmitters are still in use. I suspect quite a few. Many have been modified to operate on the 160 metre band following an article in this magazine by John Adcock VK3ACA. No doubt too, many are still being used on CW and it is with this in mind that the following modifications were devised.

When used in the CW mode the G222 developed quite a strong and objectionable back wave. Keying is effected in the cathode of the 5763 driver with fixed bias applied to the 6146 final. The trouble is in two sections. Firstly, there is insufficient fixed bias to completely cut off the 6146. In the key up position there is still quite a deal of plate current. The 5763 cathode is returned to the high tension line through a 100K ohm resistor with the key up in order to cut this stage off. In practice there does not seem to be enough cut off bias applied to either stage.

Firstly reduce the 100K ohm register in the 5763 cathode to 50k by paralleling the first resistor with a second of the same value. Make sure it has a two watt rating. The next step is to add a voltage doubler supply. The original bias supply is left intact as this still has to provide bias for the 807 modulator tubes. New components needed are two 200 mfd electrolytic capacitors rated at 150 to 200 volts working plus two 400 piv silicone diodes. Connect the positive end of one of the electrolytics to the transformer connection on the existing bias rectifier N8918. Connect the cathode end of one of the diodes to earth, the opposite end to the negative side of the electrolytic just mentioned. Connect the cathode of the second diode to the same point. The second electrolytic connects positive side to earth, negative to the output of the second diode and then to the bias line to the 6146 final.

So far two Geloso transmitters have been modified as described, both owners reporting greatly improved results.

●

Try This

with Ron Cook VK3AFW
and Bill Rice VK3ABP

SHIFTING THE FREQUENCY OF A CRYSTAL

Lower.—A coating of finger nail polish thinned down with cuticle remover will lower the frequency of a crystal considerably. Very little, if no effect, on the strength of the oscillation will be noticed.

Higher.—To shift the frequency higher, give one side of the crystal a few light rubs with a little Bon Ami.

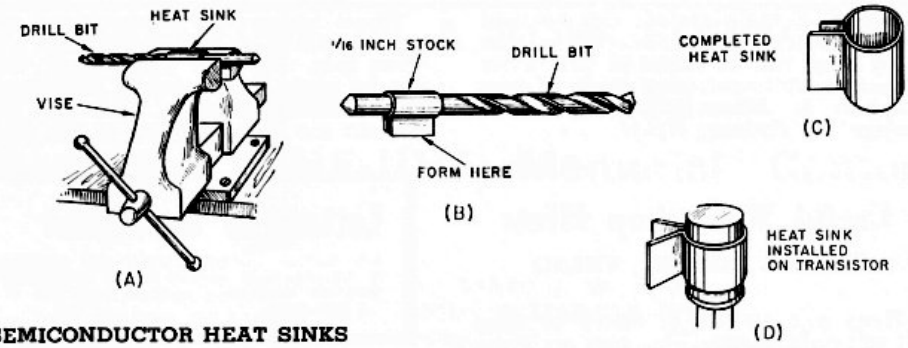


Fig. 4.—Steps used by W1CER in constructing heat sinks for small transistors.

SEMICONDUCTOR HEAT SINKS

HOME-MADE heat sinks can be fashioned from brass, copper or aluminum stock by employing ordinary workshop tools. The physical dimensions of the heat sink will depend upon the type of transistor used, and the amount of heat that must be conducted away from the body of the semiconductor.

Fig. 3 shows the order of progression for forming a large heat sink from channels of near-equal height and depth. The width is lessened in parts B and C so that each channel will fit into the preceding one as shown in the completed model at D. The three pieces are bolted together with 8-32 screws and nuts. Dimensions given are for illustrative purposes only.

Heat sinks for smaller transistors can be fabricated as shown in Fig. 4. Select a drill bit that is one size smaller than the diameter of the transistor case and form the heat sink from 1/16 inch thick brass, copper or aluminum stock as shown in steps A, B and C. "Warp" the stock around the drill bit by compressing it in a vise (A). The completed heat sink is press-fitted over the body of the semiconductor as illustrated at D. The larger the area of the heat sink, the greater will be the amount of heat conducted away from the transistor body. In some applications, the heat sinks shown in Fig. 4 may be two or three inches in height (power transistor stages). — *W1CER*

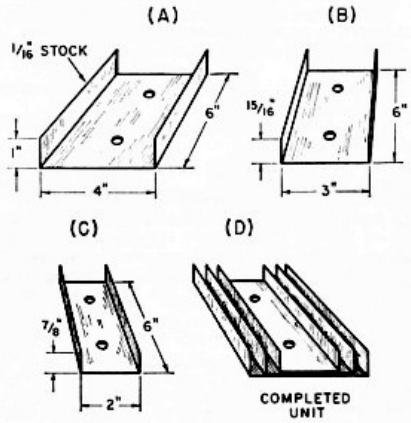


Fig. 3.—Details for forming channel type heat sinks.

Suitable springs to replace those in drill chucks can be obtained from old motor tyre valves.—VK2AC.

* * * *

When carrying a multimeter, turn the selector switch to a high current range. The low resistance shunt across the meter is as good as shorting the leads together for heavily damping the meter and helping prevent bent needles and jarred movement.—VK3AKZ.

LOCATING EARTH WIRES

Take the following situations. 1. You want to plant a shrub in the back yard and know you have some radials somewhere thereabouts. Rightly you don't want to damage them by digging. 2. You know there is a water pipe running somewhere past the shack and would like to take an earth wire to it. Puzzle, how to find where they run?

Answer. Take the active lead of a modulated signal generator to the radial system or kitchen tap as appropriate and leave the other end float. Set the sig. gen. about 550kHz. Borrow junior's transistor radio (you wouldn't have one of those devices yourself) and tune to the same frequency. Point the ferrite rod vertically to the ground and you can't miss the tone. On walking around you will find a null as you pass over the buried object. The closer to the ground the sharper the null.

In fact in tracing water pipes I push a long screwdriver into the ground where the null is indicated and meet the pipe every time. It will separate pipes 2" apart.

By using the antenna at 45° after having determined the vertical null, another null, not so sharp will be found and the distance between the two will be the depth of the pipe or wire.

Ken Gillespie, VK3GK

WHERE IS THAT RESISTOR?

How often is the junk box raked over for a resistor of some particular value or, if there is some order in the shack, how many times is a cascade of assorted resistors poured out on the bench and the resulting heap explored at length?

The problem has been solved here by a simple filing system using flat 50 cigarette tins and a few dabs of paint. Seven tins are used and the ends are painted respectively black, brown, red, orange, yellow, green and blue. Resistors are stored under the colour representing their multiplier (R.M.A. Colour Code), i.e., the colour of the third band or the dot.

When a resistor of a particular value is required, the tin of the appropriate colour is selected, e.g., red—thousands of ohms, or yellow—hundreds of thousands of ohms. The wanted resistor usually presents itself without further ado—or the nearest approximation is immediately available.

A similar filing system can be used for capacitors. It is remarkable how many items can be stored in this rather attractive, gaily-coloured stack of tins. —Robert H. Black, M.D., VK2QZ, 36 College St., Sydney, N.S.W.

Useful Workshop Hints

By N. E. COXON, VK6AG

Miss print W.E. Coxon

Keep a container in which to drop all odd nuts, screws, etc., that are come by from junk, alterations, or off the floor. Then, apart from a valuable source from which to find that odd screw, etc., periodically the container can be emptied into respective screw and nut compartments.

* * * *

Sheet aluminium is best divided by nicking and breaking. Have an 18" length of 1" angle iron held together by 2 x ¼" bolts at the ends to form a clamp. Mark the line to sever, clamp and hold in vice, cut with point of a strong penknife, and bend several times, and the break is clear, straight, and no twists in the aluminium.

* * * *

Tinned copper wire used as bus bar often is tarnished when bought. To clean, rub with a wire file brush, and to straighten, hold end in vice and hold other end in flat nosed pliers. Give a sharp jerk and the wire is straight.

* * * *

Whenever a screw is shortened by cutting with pliers, always file off the burr, for you never know when it will be necessary to remove the nut, and no end of difficulty is experienced when a screw head has been chopped off. Brass screws are bad enough, but steel screws treated in this way are time wasters.

* * * *

When tapping sheet metal, it is safer to hold and tap the hole by using the tap (1/10th" to 5/32nd") in a wheelbrace.

* * * *

Paint with various bright colors, handles of small screw drivers, spintight spanners, and various other tools. It makes them easy to find when bundled together on the bench (not always as tidy as desirable).

* * * *

Keep a small bottle of thin oil with a wire dipper handy. Many a nut, wood or iron screw is coaxed along by a little lubrication.

* * * *

When a small drill is broken, insert and solder the broken portion into a shank. It makes a more robust drill, and uses the portion with the best cutting section. The contributor has often deliberately broken off ¼" from a small drill to fit it to a larger shank. Solder is quite sufficient to hold it.

* * * *

Wheel braces will take several size larger drills if the shanks are filed with three flats. By such means a ¼" drill can be made to slip into a wheelbrace made for 3/16" shanks. The flats also prevent the drills slipping in the jaws. ●

Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

R. A. Dietz,
P.O. Box 3
Kearneysville,
West Virginia,
25430,
USA.

Dear Sir,

I am an amateur radio operator in the USA. My call is W8KKB, and my licence is advanced class. I live in the state of West Virginia about 60 miles west of the nation's Capital, Washington.

I like to work DX or long distance contacts as many other hams do, but the quantity of countries worked, such as for an award like DXCC etc. does not interest me as much as trying to span the greatest possible distance.

In my 20 years of amateur operation, my farthest contacts have been with New Zealand.

Geographically Australia is on the other side of the world from me. The city of Perth in VK6 land is the farthest inhabited area on Earth from where I live.

I would derive immense personal pleasure from making one or many contacts with Australian amateurs.

I have heard VK stations many times on 40 and 20 metres, but they are an elusive group to contact. Like most other DX stations they are probably sick of working thousands of US hams and would like to talk to hams in other countries. Generally when they do work US stations, the kilowatt boys out in California catch them before a low power station on the East coast like myself has much of a chance.

I run about 150 watts SSB or CW (at 15 wpm) to a dipole on 80 through 10 metres.

I recently wrote to the ARRL inquiring about Australian Amateur activity and was amazed to find out your max. pwr. is 150 watts, and you do not operate in the American phone bands on 40 & 80 metres.

The purpose of this letter is to find out anything I can about VK hams that will help me to contact them.

On 80 through 10 metres what are your phone & CW frequencies?

Do you have any awards such as "worked all territories"?

Are there any particular frequencies where VKs like to work DX?

Are there any DX nets, and at what time & freq. are they in operation?

What is your code speed requirement?

I have heard about your pending Novice License and would like to know what frequencies they will be allowed to use, what power and what code speed?

Any information you can give me regarding the above will be deeply appreciated. Thank you for taking the time to read this.

Rudy Dietz,
W8KKB.

Rudy's address is published so that VK DXers can write to him, answering his questions, and perhaps arranging scheds. Ed. ●

Magazine Index

With Syd Clark, VK3ASC

BREAK-IN December 1973
A Variable Crystal Oscillator: Three Band Trapless Vertical: Radio & Television Interference from Electrical Appliances: Amateur Radio—The Preservation of Its Right to Operate: Oscar 7 and its Capabilities.

RADIO ZS. December 1973
RC Signal Generator: Microphones VSWR and all that: ZS Land and VHF: Quartz Crystal and Frequency Standards: Radio Breakthrough on Hi-Fi Equipment.

HAM RADIO. November 1973
Low-Power Solid-State VFO Transmitter for 20 Metres: Test Set for Motorola Radios: Variable Shift RTTY Terminal Unit: Medium Current Polarity Inverter: Single-Band SSB Transceiver: Single Frequency Repeaters for VHF FM: Open Wire Impedance-Matching baluns: Compact Electronic Keyer Package: Calculating Gain vs Height of DX Antennas: Antenna and Control-Link Calculations for Repeater Licensing.

RADIO COMMUNICATION. January 1974
Gains and Losses in HF Aerials: Technical Topics features TVI Statistics, Aerials a la G6XN, Baluns in reverse, Compact Beams, VK2ABQ Triband Beam, AGC-controlled RF Attenuator Mark 2, Neutralising FET Amplifiers & Cocktail Parties in Practice.

QST. December 1973
A Solid-State Transceiver for 160 metres: How to Build an SSB Transmitter: New Front End for Heath HW-7: Using the ARRL L/C/F/ Calculator: High Performance 20, 40, and 80 metre Vertical System: A 2KW PEP Amplifier for 144MHz: International Friendship Through Amateur Radio: The ARRL Intruder Watch: Oscar News.

AUSTRALIAN EBB. June, August & October, 1973
Three issues of this journal arrived in my mail during the month and they cover a wide selection of subjects, not all of them electronics. There is much to interest experimenters generally, Enquiries to P.O. Box 177, Sandy Bay, Tasmania, 7005.

MOBILE NEWS. November 1973
News and views of the European Mobile scene with particular emphasis upon what is happening in G Land. Those interested should contact N. A. Fitch, G3FPK, 40 Eskdale Gardens, Purley, Surrey, England, CR21EZ. ●

Awards Column

with BRIAN AUSTIN VK5CA
P.O. Box 7A, Crafers, SA, 5152.

As a result of the recent changes in credits for Germany as notified in last month's AR, and the probable alterations as a result of changes in Papua New Guinea, very nearly all, if not all listings for the DXCC Award will have to be adjusted. When this is done, a complete list of members and their scores will be published in this column.

As in past months, I set out below details of some of the Awards available from other countries:

WAGE AWARD

1 The award is available to licensed amateurs
2 Contacts after November 1945 are valid
3 QSL cards and a check list must be submitted to the sponsors
4 The fee for the award is six IRCs
5 The address for applications is: Radio Club of Chile, Casilla 13630 Santiago, Chile.

Requirements: Confirmed contacts are required with 8 out of the 10 Chilean call areas.

FIRECRACKER

1 The award is available to licensed amateurs and shortwave listeners (on a "heard" basis)
2 Contacts on and after 1st January 1964 are valid
3 Do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager
4 Awards are issued for all CW, all Phone, and mixed modes
5 The fee for the Award is 10 IRC (postal orders, stamps or cash are not acceptable)
6 The address for application is: QSL Manager, HARTS Post Box 541, Hong Kong.

Requirements: Stations require confirmed contacts with six different VS6 stations.

4X4 — 16 AWARD

1 The award is available to licensed amateurs
2 Contacts with the State of Israel only are valid
3 Do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager
4 The fee for the award is ten IRCs
5 The address for applications is: Israel Amateur Radio Club, Post Box 4099, Tel Aviv, Israel.

Requirements: Confirmed contacts are required with 16 stations in Israel with four bands represented. ●

Contests

with Peter Brown VK4PJ

Federal Contests Manager, G.P.O. Box, 638
Brisbane, Qld., 4001.

NOTES ON THE ROSS HULL VHF-UHF MEMORIAL CONTEST 1973-1974

Congratulations Kerry on another fine win with Stephen VK3ZAZ and Wally VK5ZWW running well in second and third place. Ivan VK4QO, VK7AH and Bob VK3AOT put up excellent performances. Kerry used 6 metres almost exclusively.

Thanks for all the comments which indicated that the contest was great DX-wise and very friendly. As one operator commented "Just like the RD contest".

Stephen VK3ZAZ, had the surnames of eacn of his contacts listed on his log. Again I say, if you have time to exchange names, try and do so . . . .everyone improves on acquaintance. I received 12 comments on the distance scoring table metric conversion and there were some very constructive comments which will help in setting up next years table.

This year it was made quite clear, by a great majority of those who commented on times, that we should be GMT wholly . . . i.e. start and finish on GMT days as well as use GMT.

Kerry VK5SU went to some trouble with his comments and I quote afew of them.

"CW, AM, SSB, and FM modes were again used, mainly SSB.

The trend is interesting. Of my 1008 contacts the modes received were as follows.

	1972/3	1973/4	
SSB	52%	70%	More SSB
FM	30%	24.5%	Too many on 52.525
AM	17.9%	5.4%	
CW	.05%	.08%	

Contacts made		Different stations worked	
1971/2.	445	1971/2	156
1972/3	602	1972/3	196
1739/4	1008	1973/4	252

Among Kerry's other constructive comments was a table indicating that the proportion of full to limited licencees who made contacts in the contest is changing from 1-2 to nearly 1-1. Thanks OM.

Bob, VK3AOT provided the most constructive suggestions on the metric distance scoring table, and "It has been a thoroughly enjoyable contest with more activity, more competition and better operating standards than last year . . . "

Ron, VK3AKC, one of the few who logged 1296 MH,z suggests that 2300MHz be double 1296MHz.

A few stations logged 432MHz and a few more 144MHz but the great mass of contacts was on 6 metres.

With 6 metres the primary band, doubtless some of the capital city station ops were at a disadvantage.

I did not receive any comment on the two contact per day rule so presumably everyone was happy? Yes, one comment in favour. Two ops mentioned that SSB stations often did not reply to AM stations.

As far as CW is concerned with but one entrant should we continue with CW as a section (c)?

There were seven logs in the open section (a) with not a great number of contacts.

You will note that two New Zealanders also enjoyed the contest.

LOG RETURN

I thought that we would have done a lot better this year. Instead of two logs to eleven who joined in last year we have two to ten who joined in this year.

As one of the contestants commented "nearly everyone knows how the other fellow is going in the contest and if he has not a show of winning any section of the contest then it is not worthwhile him submitting a log."

Should we be satisfied with 30% improvement this year? 16 logs.

THIRD TIME IN A ROW FOR VK5SU

Results of the 1973-4

Ross Hull VHF-UHF Memorial Contest

Trophy winner. **VK5SU J. W. K. Adams**
48 Hour certificate. **VK3ZAZ S. R. Gregory**
Detailed scores. First column 7 day.
Second column 48 hour.

SECTION (A) TRANSMITTING OPEN		
VK2BHO	3665	1222
2ZAM	—	1250
2HZ	608	406
VK3VF	375	181
VK4QO	5110	1620
4FH	2495	930
VK5SU	7300	2535
SECTION (B) TRANSMITTING PHONE		
VK1MP	2655	—
1VP	2565	1205
1DA	1795	860
VK2ATQ	799	431
2BMX	717	275
2YAV	582	300
2ZCT/T	382	156
2ZVJ	210	100
2DC	—	941
VK3ZAZ	6000	2211
3AOT	4638	2189
3AKC	4278	1372
3ASQ	3558	1575
3ASV	2662	911
3YFL	2052	884
3ZBB	1821	763
3BFG/T	1594	551
3ANP	1460	655
3ZGP	1274	527
3ZNQ	1402	687
3AUQ	1136	395
3BMD	1028	—
VK3ZYO	1001	480
3ZIM	check	
VK4ZAM	2479	775
4ZDI	1205	615
4ZTL	905	785
4ZRG	480	160
4ZGR	125	61
4PJ	check	
VK5ZWW	5332	2100
5ZMM	590	255
5LP	462	210
5BW	71	60
VK6ZJD	3265	1611
6ZGZ	860	650
6ZDG	110	95
6WG	—	1710
6QR	105	75
VK7ZAH	4998	2180
7ZAZ	2020	895
7ZGJ	617	353
7AX/T	34	—
SECTION (C) TRANSMITTING CW		
VK3KX	332	189

SECTION (D) RECEIVING

J. M. Hilliard 1745

Also

ZL1QI — 100 contacts
ZL2AID — 90 contacts

JOHN MOYLE MEMORIAL NATIONAL FIELD DAY

Many people in the northern parts would be recovering from flooding at the time of the contest.

I hope that many can see the virtue of being able to operate without mains power. Doubtless you will read of the assistance given by some VK4 amateurs in the flood disaster and realise that after all the "impossible" can happen and you and your field outfit may be worth many lives. Many Brisbane people now accept that the disaster could have been much worse . . . but next time the disaster may be "what", in whose area?

Don't say it can't happen to you.

So far quite a few logs to hand but too soon to tell how we are progressing. I squeezed in a couple of hours and thought the going good, though I only made 40 metres and 20 metre contacts.

15 metres was too poor for me but I heard VK5SR laboriously extracting numbers from reluctant Japanese stations. VK8DA was the highest scorer I heard.

CONTEST CALENDAR

April 6th-7th VHF Space net
April 6th-7th SP DX CW Contest
April 7th WAB LF phone Contest (1.8, 3.5, 7MHz)
April 12th-14th Novice QSO party, Contact W& K novices
April 14th WAB LF CW Contest. (1.8, 3.5, 7MHz).
April 20th-21st WAEDC RTTY Contest
April 20th-21st Bermuda phone Contest
April 27th-28th PACC DX Contest
April 27th-28th HELVETIA 22 Contest
May 4th-5th Bermuda CW Contest
May 11th World Telecommunication CW
May 18th World Telecommunication phone

SP DX CW CONTEST

1500 GMT Saturday April 6th to 2400 GMT Sunday April 7th.

The world working SP's 3.5 thru 28MHz.

Single OP; single and all band. Multi-op all band. SWL's also. Send usual RST and receive RST plus letters (powiat letter.) Each SP QSO. 3 points with multiplier fo each powiat. (Once only). Separate sheet for each band, summary sheet and declaration. Mailing deadline May 1st. PZK Contest Committee, P.O. Box 320, Warszawa, 1, Poland.

NOVICE QSO PARTY

1800 GMT Friday April 12th to 0600 GMT Sunday April 14th. USA Novice bands. 3.700-3.750, 7.100-7.150, 21.100-21.200, 28.100-28.200. Logs to Andi Anderson,WB9FGM, RR 3, Box 85-26, Belvidere, Ill. 6100B.

WAB WORKED ALL BRITAIN

These are 12 hour contests from 0900 GMT to 2100 GMT.

Exchange RS/RST and QSO number. UK stations will give country and WAB area number as well.

Each contact worth 5 points. Multiplier is the number of different UK areas worked, counted once only.

Certificates to leading stations in each VK call areas.

Logs to J. E. Hodgins, G3EJF, Bridge House, Hunton, Bedale, Yorks, England.

PACC DX CONTEST

1200 GMT Saturday 27th April to Sunday 1800 GMT April 29th. 1.8 thru 28MHz, CW and phone. One contact per band per station. Either CW or phone, for QSO and mulitplier credit (CW only on 160). Usual RS (T) and serial. Mulitplier is by provinces worked on each band. There are 12.

Final score-total QSO points X sum of provinces from all bands, max 72. Certificates to top scorers in each country and call areas (VKs). Summary sheet, name and address in blocks and declaration.

Logs to L. V. D. Nadort, PA0LOU, Contest Manager, Bespolderstraat, 15, Nieuwerkerk, a/d Ussel, The Netherlands.

HELVETIA 22 CONTEST (22 Swiss Cantons, There is a H22 Certificate)

1500 GMT Saturday 27th April to Sunday 28th 1700 GMT. 1.8 thru 28MHz. The same station may be worked on each band and mode for QSO and multiplier credit.

Usual RST. Swiss stations will include their Canton.

Cantons are—AG, AR, BE, BS, FR, GE, GL, GR, LU, NE, NW, SG, SH, SO, SZ, TG, TI, UR, VD, VS, ZG, ZH.

Each QSO counts 3 points. The multiplier is the sum of Cantons worked on each band, a possible 22 on each band.

Final score is QSO points by sum of Cantons from all bands. Mail log within 30 days to USKA Traffic Manager, HB9AHA, im Moos, 5707 Seengen, Switzerland.

PROPOSED AUSTRALIAN AND WORLD WIDE MOBILE CONTESST

Suggested Rules

1. Contacts may be made mobile to mobile or mobile to fixed station on any Amateur band. Cross band operation not permitted.
2. Contacts may be phone, CW or cross mode.
3. Contacts may be made with stations inside or outside the operator's country.
4. Where a mobile station passes into another country the station is deemed to have started a new log.
5. Contacts may not be made between fixed stations.
6. No Beams or fixed **aerials** may be used by mobile stations.
7. All mobile stations entering the contest must operate from the normal vehicle electrical supply.
8. Contest is confirmed to land mobile stations.
9. Signal reports and serial number starting from 001 and progressing one for each contact must be exchanged.
10. The scoring shall be as follows:
    Mobile to fixed station in the same country . . . 1 point.
11. Mobile to mobile station in the same country . . . 3 points.
12. Mobile to fixed station in another country . . . 5 points.
13. Mobile to mobile station in another country . . . 10 points.
14. Mobile stations to multiply points scored . . . by kilometers travelled during the contest . . . divided by the number of operators. (That is a good one Syd.)
15. Contest will run for 24 hours from 1000 Z on 23rd December to 1000 Z on 24th Deecmber. (That will be cold for the northern hemisphere operators??)
16. All entries to include complete description of gear used together with map of route taken during contest.
17. Check sheets will be included with all contest logs and must be signed by two amateurs.
18. Mileage indicated on speedometer before and after the contest must also be included.
19. It is not necessary to travel from point A to point B at a high speed. One of course may circulate locally to develop one's mileage.
20. Only one contact per station per band is permitted.

Send your comments to Syd VK2SG . . . I can suggest several alterations and amendments and will be in touch with Syd who provided these suggested rules.

I trust that you enjoyed the CQ WW WPX SSB contest? ●

VHF UHF
an expanding world

with Eric Jamieson VK5LP

Forreston, S.A., 5233
Times: GMT

VKO	52.160	VKORSG Macquarie Island.
VKO	53.100	VKOMA Mawson.
VKO	53.200	VKOGR Casey.
VK2	52.450	VK2WI Sydney.
VK2	144.600	VK2WI Sydney.
VK3	144.700	VK3RTG Vermont.
VK4	52.600	VK4W1-2 Townsville.
VK4	144.400	VK4W1-2 Mt Mowbullan.
VK5	53.000	VK5VF Mt Lofty.
VK5	144.800	VK5VF Mt Lofty.
VK6	52.006	VK6VF Bickley.
VK6	52.350	VK6RTU Kalgoorlie.
VK6	52.900	VK6RTT Carnarvon.
VK6	144.500	VK6RTW Albany.
VK7	144.900	VK7RTX Devonport.
VK8	52.200	VK8VF Darwin.
VK9	52.001	VK9GA Goroka.
ZL1	145.100	ZL1VHF Auckland.
ZL2	145.200	ZL2VHF Wellington.
ZL2	145.250	ZL2VHP Palmerston North.
ZL3	145.300	ZL3VHF Christchurch.
ZL4	145.400	ZL4VHF Dunedin.
JA	52.500	JA1IGY Tokyo.

There have been no reported changes this month to the various call signs and operating frequencies of the beacons.

GENERAL NEWS

Noted from the pages of "Q.R.M." (Launceston) that during the last Ross Hull Contest Kevin VK7ZAH managed to work Ron VK3AKC twice a day on quite a few occasions on 52, 144, 432 and 1296 MHz. This is quite an achievement. Daniel VK7ZDA is now operational on 144, 432 and 1296 MHz and probably has that 6 foot dish erected in the front garden.

ON THE SUBJECT OF NETS

On the subject of net operation, this page has tried at all times to steer a sensible course, and in line with this policy the following letter should be of interest to ALL VHF OPERATORS and I suggest you read it. It was first published in January, 1974 "**6 UP**" and comes under the heading of "LETTERS"

With regard to the FM nets and repeaters, and sensible attitudes towards that sort of operation, here's a letter that gets it all together—and makes a great deal of sense . . .

> "Dear Sir. May I suggest a series of articles (in 6 UP) on how to technically move away from the nets. i.e. easy steps. Might I also suggest that a few people could re-think their "hard-line" attitudes towards the nets with an article along the following lines:- 'Don't Knock the Nets; or What Net Doesn't Need a Net Channel?'
>
> The nets gave me —
>
> (1) A chance to learn. With no radio background it's a formidable task to get the "feel" of the business.
>
> (2) A chance to get to know the locals. You haven't got 40m. if you've got a Z call.
>
> (3) Some contact with good construction practice. Mobile, ex-commercial gear is rugged and a good example to start from — granted that those with experience may be able to do better, but someone attempting to follow commercial practice will probably finish up better off than struggling on alone.
>
> (4) A place to learn when things are working. i.e. If you are familiar with things and how they sound, an open circuit coax connector won't be a major problem and you will learn to recognise when a receiver is working O.K. I count harmonics on a cheap signal generator at 6 and 2 metres with a standard antenna — a very handy reference.
>
> (5) A place to learn about antennas and demonstrates the benefits of a properly built one — also the effectiveness of good quality coax etc. Instal good coax and really hear the difference.
>
> (6) Finally, the nets give a chance to find and get to know the locals when moving QTH. Amateurs are not always THAT social. If amateurs are not part of a group, or unified in some way, then no real technical progress can be made.
>
> The real problem as I see it, is not the nets per se, but **staying** on the nets. One suggestion is for the more technically advanced to come on the nets and talk about other activities and areas and ways and means of making the change.
>
> Perhaps a list of phone numbers and call signs of people interested in helping etc. could be published — this has obvious problems as no one wants every nut calling etc. But people who have recently built something are usually keen to talk about it for awhile. Listing the callsigns of newcomers to 6, 2 and 70cm SSB who are prepared to talk might also be a good thing. 73. Gordon Woolston. ex-VK2YC, soon VK4??"

Well, what about it?

I regret it has not been possible to present much in the way of news this time. Without making too much in the way of excuses, I must say that two nights of school each week (Colour TV Service Course) plus an hour of homework each night of the week, exams for same once a month, isn't exactly conducive to getting on the bands and hunting up information. No one has written with anything fresh this time, so that's about it. You may have to grin and bear such a situation from time to time throughout this year until the service course finishes at the end of the year. I will do the best I can under the circumstances, but anyone who is really upset can quite willingly carry on in my place for the time being; it will give me a couple of extra nights a month to study!

Anyway chaps, in an effort to help me to help you for the time being, what about some regular correspondence of happenings of a national interest. Local gossip is not what we are looking for; anyway the Editor won't print it if I send it in! Thanking you in advance for any help you can give.

Closing with the thought for the month: "Love looks forward, hate looks back, anxiety has eyes all over its head." ●

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In terms of PMG directions* from 1.3.1974

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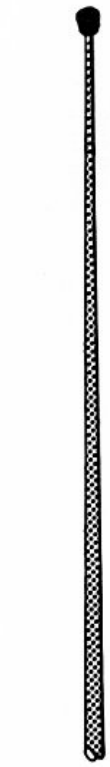
* Letter V 228/1/17 of 30.11.1973 (services)



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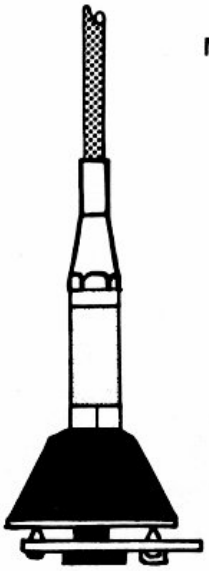
MODEL MGB



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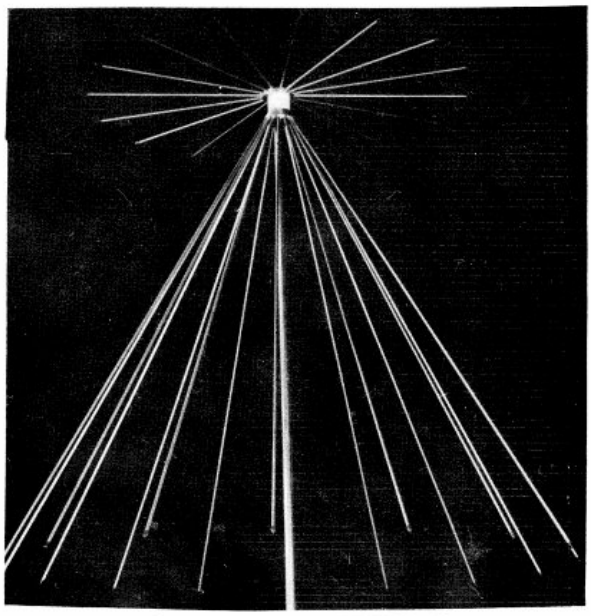

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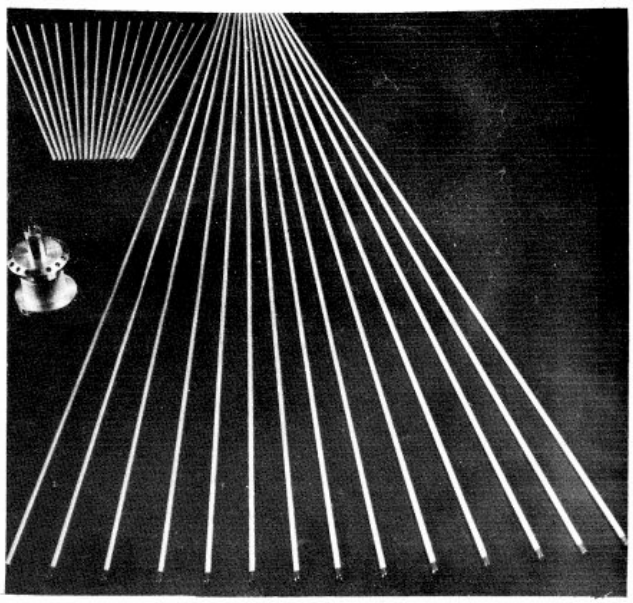

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Dielectric Strength per ASTM D-150:
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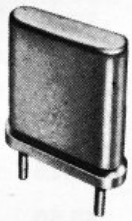

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CLUB/ZONE/DIVISION NEWS

- The Publications Committee wishes to advise that the call on AR for space to print material is so great it is not possible to include a section devoted to Divisional, Zone or Club news.
- Arrangements were made with all Divisions that such news would appear in Divisional Bulletins if so required, and accepted by Divisional Bulletin Editors. Bulletins, when submitted, are carried as inserts in AR mailed to members of the Division concerned.
- It has been agreed however that AR should include an Events Diary to contain **very brief details** of forthcoming events. Items for this Diary **MUST** reach the Editor not later than the 1st of the month prior to publication.

Y.R.S.
with Bob Guthberlet

Methodist Manse, Kadina, S.A., 5554

From time to time I receive letters from State Supervisors informing me of the dearth of helpers; that there is a tendency for clubs to be started in schools, and the instructor (a teacher) is transferred to another school, and the club collapses, sometimes leaving valuable equipment idle. This is one of the penalities of such clubs and is an area for investigation on the part of YRCS. Another observation is that some clubs, whilst using our teaching notes and issuing our certificates, are not willing to accept the polity of the Scheme. It is my contention that all clubs using our curriculum and issuing our certificates are required to accept the constitution of YRCS. Further, examination of students, should at all times, be subject to, and under the supervision of an accredited YRCS official.

May I commend the kits being distributed by Dr. Bob Callander for VK3. As an exercise I have obtained several of these, and for experience in wiring, performance, etc. I can vouch that they really work.

Allan Dunn, S.A. State Supervisor, reports four new clubs this year, with the most successful School Club being the Sacred Heart YRC, and the best Non-school Club, the Adelaide YMCA Electronics Club. These clubs will be recommended for the IREE Pennant. Carl Minerds of St. Marys Boy Scouts YRC will receive the book prize donated each year by Philips Industries. Good work, Carl.

Ere this State Supervisors will have received from the Standardisation Committee, a copy of the amended syllabuses. It is recommended that the revised Elementary syllabus be used on a trial basis until August, following which it will be presented to the Supervisors Conference for assessment.

Of interest is the monthly circular sent to all S.A. club leaders by Allan Dunn, and I recommend that this be done by other supervisors. Club leaders may not acknowledge receipt of your communication, but, at least, you as a supervisor will have done your part in communicating! ●

20 Years Ago
with Ron Fisher VK3OM

April 1954.

Are Conventions necessary? This is the question posed by the Federal Executive in the April 1954 Editorial column. That year a convention was not held due to the decision of the Federal Council apparently somewhat against the thoughts of Federal Executive. One paragraph is worth repeating: "Your Federal Councillor has a very important task — keep him fully informed of your local problems; make him work all the year round; do not assume that he only comes to life when a Convention is held."

One of the great sagas of amateur radio was recalled by VK5PS. April 1954 saw the passing of K7UT Clyde de Vinna. During the winter of 1932 Clyde was working for MGM, filming in Alaska. While in contact with a ZL he was slowly overcome by carbon monoxide fumes. The ZL sensed trouble and contacted another station who was able to arrange a rescue party in the nick of time.

Technical articles for April included one of Hans Ruckert's famous papers. Short Wave Receiver Selectivity Problems and the Double Crystal filter as the answer. It was about this time that we were starting to discover that selectivity for phone reception was more than just a lot of IF transformers back to back. The ideal flat top response was not easy to achieve. Hans looked at the problem and made some good suggestions to overcome it.

The results of the 1953 VK-ZL DX contest give us an idea of just who the top DX men of the period were. VK2GW topped four sections, the open, 7MHz, 14MHz, and 21MHz. In the phone section VK4SF was outright winner in the open, 14 and 21MHz sections. Other high scorers included VK3XK, VK4RT, VK4KS and VK5MS. It seems that floods on the North Coast of New South Wales were a problem in 1953 as they have been this year. Amateurs were right up with things providing communications in and out of devastated areas. Bill Morore VK2HZ told the story of how they did it. ●

Hamads

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Copies of QST 1970—74 price plus freight paid. VK3KE. QTHR

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R. M. MORRIS, VK5UI

OBITUARY

W2CC — K1CC

Scores of Australian hams who operate CW will be saddened at the passing of Al Scarlett K1CC (ex W2CC) on 22 January, 1974. Al, who was active for upwards of 40 years was a disciple of anything and everything Australian. He was a gentle man and a gentleman, and visited Australia in 1963. He maintained weekly CW schedules with the late VK5HG, the late VK3HL, VK2QJ, VK5BO, VK3XB and the writer, for periods ranging up to 43 years, his QSO tallies with the abovementioned stations ranging from 500 to 1300. His home at Scarsdale NY and later in Englewood Florida was always open to visiting VK hams.

Ray Jones VK3RJ

THE "40 AND OVERS" STRIKE AGAIN!!!

At the suggestion of Bob Cunningham, VK3ML, a dinner was held in the Science Club of the Institution of Radio and Electronic Engineers in Melbourne on Monday 25th February, 1974. This dinner was a get-together of VK3 hams who had held a licence for 40 years and over. This was a most successful evening and voted by all who attended as being one of the best nights at which they had been present for many years.

The guest speaker on this occasion was Alan Butement, VK3AD who has been residing in Australia since about 1956 and prior to that had been G6TM. Alan Butement gave a very enjoyable reminiscence of the early days of radio from the UK in the era of the initial contacts of G-land to Z (ZL) and A (VK) areas. Alan carefully outlined the trials and tribulations of manufacturing equipment and antenna systems in these early days. He quoted from the official records of the RSGB the initial contacts with New Zealand and Australia to which the meeting listened with much excitement and interest.

The address in reply was given by Max Howden now VK3BQ who, as we all know, was one of the original amateurs to contact Europe and the United States as far back as 1923.

It was a most exciting and interesting evening, interspersed with remarks by the 38 hams who attended the dinner, not only with details of their early days in amateur radio, but with highlights which had occurred up to the present time.

No actual record was kept of the attendances but they did include Vaughan Marshall VK3UK, Ray Ohrbom VK3OC, "Snow" Campbell VK3MR, Chris Rainbow VK3JR, Geoff Frew VK3PM, Bruce Mann VK3BM, Geoffrey Thompson VK3AC (formerly VK3GT), Gavin Douglass VK3YK and George Glover VK3AG. Because no official record was kept of the attendances it is regretted that a complete list is not available for publication.

Respects were paid to the many early day amateurs in all the States including many famous names and call-signs such as Chas MacLurcan VK2CM, Harold Cox VK1GU (formerly VK3BD), Ross Hull, Wally Coxen and many others.

For the sake of posterity and the history of amateur radio in Australia, a recording was made of the talk by VK3AD and VK3BQ which we hope will be filed in the Archives of the Wireless Institute of Australia. ●

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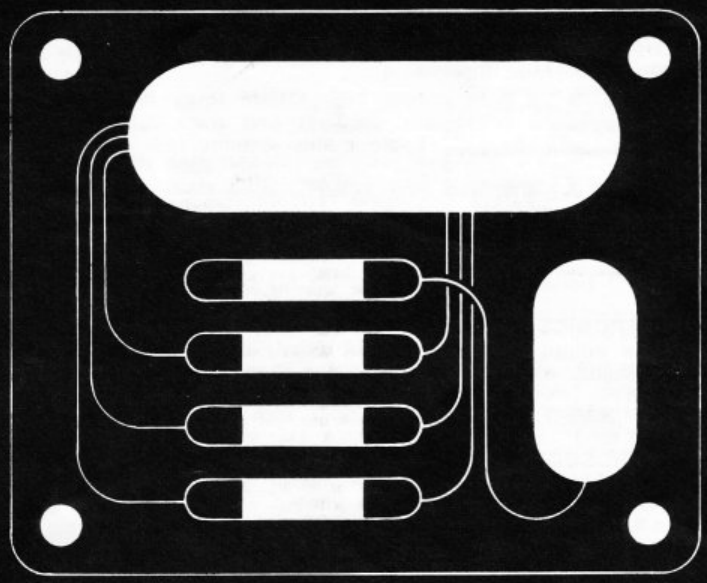

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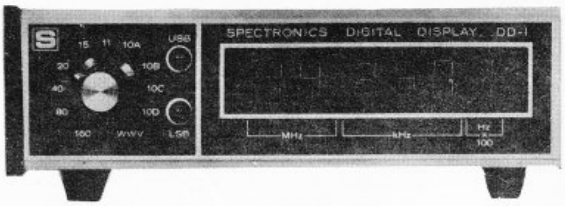

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